

WILDLIFE BIOLOGICAL EVALUATION

ROADS & PLANTATIONS PILOT PROJECT

**South Fork Management Unit,
Shasta-Trinity National Forest**

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EXECUTIVE SUMMARY

This Biological Evaluation analyzes the effects of treatments proposed in the Roads and Plantations Pilot Project on designated Forest Service Sensitive wildlife species known or expected to occur on the Shasta-Trinity National Forest (Forest). Table 1 lists determinations for the wildlife species designated by the Regional Forester as sensitive species on the Forest. For the species with suitable habitat or known occurrence within or near the project area, the table also summarizes project design features/resource protection measures that reduce the potential impacts of proposed activities. The other species have distributions outside of the project area. The latter are not analyzed in detail because the project will have no direct, indirect, or cumulative effects on them. The project complies with the Forest's Land and Resource Management Plan (Forest Plan; USDA Forest Service 1995), the National Forest Management Act (NFMA; 16 U.S.C 1600-1614), and United States Department of Agriculture Forest Service Policy (FSM 2670.32) for documenting effects to sensitive species.

Table 1. Summary of effects to sensitive wildlife species

Species	Effects Determination ¹	Project Design Features/Resource Protection Measures (RPMs)
Northern goshawk <i>Accipiter gentilis</i>	No trend toward federal listing	SR ² for activities within 0.25 miles of known goshawk nest sites (no nests currently present)
Yellow rail <i>Coturnicops noveboracensis</i>	No effect. Outside of range and no suitable habitat	N/A
Willow flycatcher <i>Empidonax traillii</i>	No trend toward federal listing	Riparian reserve (RR) RPMs including equipment exclusion zones (EEZs); retention of riparian vegetation and less intense treatments in RRs
Bald eagle <i>Haliaeetus leucocephalus</i>	No effect. No habitat and not expected to occur.	SR for activities within 0.25 miles of bald eagle nest sites (none present)
Pallid bat <i>Antrozous pallidus</i>	No trend toward federal listing	No project activities are planned within 250 feet of caves or mines. RPMs will be applied if new caves/mines are discovered. Specified levels of coarse woody debris (CWD) will be retained.
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	No effect. No habitat (caves/mines) near project activities.	No project activities are planned within 250 feet of caves or mines. RPMs will be applied if new caves/mines are discovered. Specified levels of CWD will be retained.
Fringed myotis	No trend toward federal listing	No project activities are planned

¹ No trend toward federal listing: The project may impact individuals, but is not likely to result in a trend towards Federal listing or loss of population viability within the Shasta-Trinity National Forest. This determination is based on local knowledge of each species, habitat conditions within the project area, species status, and professional judgment.

² SR=Seasonal restrictions, also known as limited operating periods (LOPs), refer to the period of time when operations are limited or restricted. It occurs during times when species are more sensitive to disturbance.

Species	Effects Determination ¹	Project Design Features/Resource Protection Measures (RPMs)
<i>Myotis thysanodes</i>		within 250 feet of caves or mines. RPMs will be applied if new caves/mines are discovered. Specified levels of CWD will be retained.
North American wolverine <i>Gulo gulo luteus</i>	No effect. Outside of range	N/A
American marten <i>Martes americana</i>	No trend toward federal listing	Riparian reserve RPMs; Specified levels of CWD will be retained.
Pacific Fisher <i>Pekania pennanti</i>	No trend toward federal listing	Riparian reserve RPMs including EEZs; less intense treatments in RRs; retention of hardwoods; specified levels of CWD will be retained; SR for activities within 300 feet of fisher den sites.
Western pond turtle <i>Emys marmorata</i>	No trend toward federal listing	Water drafting and riparian reserve RPMs including EEZs; less intense treatments in RRs.
Shasta salamander <i>Hydromantes shastae</i>	No effect. Outside of range	N/A
Northern red-legged frog <i>Rana aurora aurora</i>	No effect. Outside of range	N/A
Foothill yellow-legged frog <i>Rana boylei</i>	No trend toward federal listing	Water drafting and riparian reserve RPMs including EEZs; less intense treatments in RRs
Cascades frog <i>Rana cascadae</i>	No effect. Outside of range	N/A
Southern torrent salamander <i>Rhyacotriton variegatus</i>	No trend toward federal listing	Water drafting and riparian reserve RPMs including EEZs; less intense treatments in RRs
Western bumble bee <i>Bombus occidentalis</i>	No trend toward federal listing	Riparian reserve RPMs including EEZs; less intense treatments in RRs
Shasta sideband snail <i>Monadenia troglodytes troglodytes</i>	No effect. Outside of range	N/A
Wintu sideband snail <i>Monadenia troglodytes wintu</i>	No effect. Outside of range	N/A
Shasta chaparral snail <i>Trilobopsis roperi</i>	No effect. Outside of range	N/A
Tehama chaparral snail <i>Trilobopsis tehamana</i>	No effect. Outside of range	N/A
Big Bar hesperian snail <i>Vespericola pressleyi</i>	No trend toward federal listing	Riparian reserve RPMs including EEZs; less intense treatments in RRs; specified levels of CWD will be retained.
Shasta hesperian snail <i>Vespericola shasta</i>	No effect. Outside of range	N/A

Species	Effects Determination ¹	Project Design Features/Resource Protection Measures (RPMs)
California floater (freshwater mussel) <i>Anodonta californiensis</i>	No effect. Outside of range	N/A
Nugget pebblesnail <i>Fluminicola seminalis</i>	No effect. Outside of range	N/A
Black juga (snail) <i>Juga nigrina</i>	No effect. Outside of range	N/A
Scalloped juga (snail) <i>Juga (Calibasis) acutifilosa</i>	No effect. Outside of range	N/A
Kneecap lanx (limpet) <i>Lanx patelloides</i>	No effect. Outside of range	N/A
Montane peaclam <i>Pisidium (Cyclocalyx) ultramontanum</i>	No effect. Outside of range	N/A

COMPLIANCE WITH LAW, REGULATION, POLICY, AND THE FOREST PLAN

A biological evaluation (BE) analyzes potential effects of a federal action on species identified as “sensitive” by the USDA Forest Service. The Forest Service defines sensitive species as those plant and animal species identified by the Regional Forester for which population viability is a concern, as evidenced by current or predicted negative trends in population numbers or viability, or current or predicted negative trends in habitat capability that would reduce a species’ distribution (Forest Service Manual 2670.5). The primary concern is at the population level, and the BE determines if agency actions are likely to lead to a trend toward Federal listing under the Endangered Species Act. Sensitive species are managed under the authority of the National Forest Management Act (PL 94-588) and USDA Forest Service Manual (FSM) Direction.

The Shasta-Trinity National Forest Land and Resource Management Plan (Forest Plan) provides protection to sensitive species in the form of management goals to maintain or increase existing viable populations of sensitive species (Forest Plan pages 3-26, 4-5). It also includes Standards and Guidelines, management direction pertaining to individual species of wildlife, and specific management direction for each Management Area on the Forest.

Forest-wide management direction for sensitive species (Forest Plan, pp. 4-5 and 4-30) includes the following:

- Manage habitat for sensitive plants and animals in a manner that will prevent any species from becoming a candidate for threatened and endangered status.
- Survey and evaluate habitat for [threatened, endangered and] sensitive species at the project level in coordination with FWS.³
- Maintain and/or enhance *habitat* for [threatened, endangered and] sensitive species consistent with individual species recovery plans.

The Forest Plan does not require surveys of sensitive species (individuals as opposed to their habitat). Additional Forest Plan management direction for specific species is disclosed in the individual species analysis sections of this BE.

The proposed action and all alternatives are in compliance with all laws, regulations, and policies pertinent to Forest Service Sensitive wildlife species, and no amendments to the Forest Plan were necessary to fulfill these requirements.

This BE describes potential effects of the Roads and Plantations Pilot Project (Project) on those wildlife species on the Regional Sensitive Species List for this Forest (USDA Forest Service 2013). This list was most recently amended on September 9, 2013. Some of these species are also designated as Survey and Manage species under the Northwest Forest Plan. These species are assessed in this document using the analysis criteria that apply to Forest Service Sensitive species. They are also assessed in the Wildlife Survey and Manage Report for this project using the analysis criteria that apply to Survey and Manage species (see project record). Separate biological assessments (BAs) address potential effects of this project on federally listed species, including the northern spotted owl (NSO) and listed fish species.

³ Threatened and Endangered species are assessed in the project-level Biological Assessment. The FWS does not have regulatory jurisdiction over Forest Service sensitive species and there are no current recovery plans for sensitive species that would be affected by this project.

Land Allocation and Management Prescription

The Shasta-Trinity National Forest Land and Resource Management Plan (Forest Plan; USDA Forest Service 1995) identifies standards and guidelines (S&G's) for various land allocations, management prescriptions, and management area directions. Prescriptions link management themes to specific types of land. Descriptions of activities allowed with each management prescription are detailed in the Forest Plan (Chapter 4F). Management direction in the Forest Plan integrates Standards and Guidelines from the "Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl" with management prescriptions developed through a forest planning process (USDA & USDI 1994). Management prescriptions are organized in relation to six types of land allocations: Wilderness, Late Successional Reserves, Administratively Withdrawn Areas, Riparian Reserves, Matrix, and Adaptive Management Areas (AMAs). AMAs are subject to S&G's and management prescriptions that govern Matrix land allocation until AMA-specific plans modify that direction. Details about the current proposed action relative to land allocations and other direction are provided in the Project Environmental Assessment (EA). Acres of land allocations within the current project area are also summarized in the EA.

Guidance for **Riparian Reserves** and **Late Successional Reserves (LSRs)** is especially pertinent to an analysis of impacts on Forest Service Sensitive species, because habitats within these allocations are used by many of these species. Other areas also support sensitive species in various ways, providing habitat and/or movement corridors.

Riparian Reserves exist to achieve nine overlapping objectives that collectively form an Aquatic Conservation Strategy. The goal of the strategy is to maintain and restore watersheds and landscapes to ensure protection of the aquatic systems to which species, populations, and communities are adapted, through protection of habitat connectivity, physical integrity, water quality, natural sediment dynamics, in-stream flows, natural variation in flow (such as floods), biodiversity, and associated habitats. Riparian Reserves (RRs) overlay other land allocations, including Late Successional Reserves and Matrix. RR widths are included in Appendix A. Within these areas, the guidance is to manage to attain the objective of the Aquatic Conservation Strategy.

Late Successional Reserves exist to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for NSO and other species associated with late-successional and old-growth forest conditions. These reserves are therefore managed to maintain functional, interacting, late-successional, and old-growth ecosystems.

PROPOSED ACTION AND ALTERNATIVES ANALYZED

The Forest Service is proposing to treat approximately 4,000 acres along approximately 40 miles of roads open to the public. The proposed action includes thinning activities in three areas: existing plantations, around treated plantations (plantation buffer), and along the two roads in the project area (roadside buffer). The treatments in the plantation buffer and roadside buffer are the same. The roadside and plantation buffers would be 300 feet total width (not including the width of the system road, shoulder to shoulder) and would be adjacent to the Indian Valley (2N10) and Butter Meadows (3N08) roads, and 300 feet around the plantations that intersect the roadside treatment area. Width of the treatment area on either side of the road could vary, but will not exceed 300 feet total width (e.g. if conditions lend to a wider treatment on the uphill side, the uphill side may be treated up to 275 feet from the road and the downhill side would be treated 25 feet from the road). Fuel reduction treatments can occur within the entire buffer. Trees that are determined to be hazards will be felled. Tree hazards include dead or dying trees, dead parts of

live trees, or unstable live trees (due to structural defects or other factors) that are within striking distance of people or property (a target). Hazard trees that are felled can be removed (and utilized). For a more detailed description of the proposed action, treatment methods and all project alternatives, see the Project Environmental Assessment. Potential effects of the action alternatives are addressed in this document in the analysis for each individual species.

The project's connected actions (primarily road maintenance/reconstruction and decommissioning, landing construction and access ramps, control line construction, and legacy sediment site restoration) will mainly occur in existing roadbeds and culvert sites. These sites have been highly disturbed, and have little or no potential value to any Forest Service Sensitive species. The locations of landings and control lines are unknown. However, due to their very small and/or narrow size, they are likely to have a very limited effect on habitat functionality for any sensitive species. Ground disturbance at sites outside the treatment units but with some reasonable potential to support these species is so limited in spatial extent that these spots were excluded from detailed analysis.

Under the **No Action Alternative**, no areas will be treated. Trees and vegetation will continue to grow and fuel loading will continue to increase without human influence, and the project objectives of improving forest health and resilience and reducing fuels will not be met. The current vegetation trends in the project area that are described in detail in the EA would continue under this alternative. Trees would be more crowded, increasing competition for limited resources including water and sunlight. Over the long term, late-successional conditions (larger trees) would be slower to develop. Continued or increased mortality of crowded/stressed trees would result in creation of snags and/or downed wood, important habitat elements for some sensitive species and/or their prey; however, many of those would be small in diameter and the result would be increased fuel loading. Long-term effects of this alternative on sensitive wildlife species include continued limitations on use of the existing road system for wildfire suppression due to safety concerns, and a higher risk of widespread and severe impacts to suitable habitats from high-severity wildfire and insect/disease outbreaks.

METHODOLOGY

General

Key considerations for the analysis of potential project impacts include the presence of a species or suitable habitat in or near the project area; the scope and nature of activities associated with action alternatives; and the potential for project actions to affect habitat suitability, habitat use, or species behavior. This BE assesses the potential for direct and indirect effects to breeding, feeding, and sheltering activities as well as potential effects to habitat suitability and population viability. Direct effects are those that result in physical harm or death to individuals, or the disruption of reproduction or other key behaviors. Indirect effects include impacts to suitable habitat and effects that occur later in time such as a shift in prey base used by a species, invasion by other species as a result of the project, or other changes to essential habitat characteristics.

The degree to which treatments may impact individuals and/or habitats is assessed in terms of three general indicators: magnitude, duration, and intensity. Anticipated short- and long-term direct and indirect effects of alternatives are evaluated using the following indicators:

- Amount and quality of suitable habitat (nesting, foraging, resting/denning, roost sites, and connectivity) maintained, degraded, downgraded, removed, or improved.
- Potential for direct disturbance to individuals as they forage, breed, or disperse.

The magnitude, duration, and intensity of impacts of project activities are assessed using the following measures:

- Proximity of treatments to known territories and/or nesting, denning, resting, or roosting habitat, and the duration and intensity of treatments.
- Potential changes in habitat suitability for each sensitive species due to project activities.

Wildlife data used in this BE originate from species and habitat surveys; Forest and State wildlife records and databases, primarily the Natural Resource Information System (NRIS) database managed by the US Forest Service and the California Natural Diversity databases (CNDDB) managed by the California Department of Fish and Wildlife; literature reviews; assessments of current conditions and future activities on National Forest Service and private lands using the Forest Activities Database (FACTS); Calfire Timber Harvest Plan data; personal communications with other Forest Service personnel; and personal knowledge based on local wildlife experience.

Selection of Species Analyzed in Detail

This BE evaluates sensitive wildlife species for the Forest by either analyzing potential project effects on species and their habitats or by eliminating species from detailed analysis based on a lack of suitable habitat or lack of occurrence near the project area. Potential direct, indirect, and cumulative effects from the project are assessed relative to population-level criteria. When no direct or indirect effects exist, the project would not impact those species. When such effects are anticipated, the BE considers effects on individuals, populations, and habitats. Ultimately, the BE addresses for each species the likelihood that the project would lead to a trend toward Federal listing under the Endangered Species Act (ESA). Tables 2 and 3 below display those species analyzed in detail, and those dropped from detailed analysis, respectively.

Table 2. Species analyzed in detail

Group / Common Name	Scientific Name
Birds	
Northern goshawk	<i>Accipiter gentilis</i>
Willow flycatcher	<i>Empidonax traillii</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Mammals	
Pallid bat	<i>Antrozous pallidus</i>
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>
Fringed myotis	<i>Myotis thysanodes</i>
Pacific marten	<i>Martes caurina</i>
Fisher	<i>Pekania pennanti</i>
Reptiles	
Western pond turtle	<i>Emys marmorata</i>
Amphibians	
Foothill yellow-legged frog	<i>Rana boylei</i>
Southern torrent salamander	<i>Rhyacotriton variegatus</i>
Terrestrial Invertebrates	
Western bumble bee	<i>Bombus occidentalis</i>
Big Bar hesperian snail	<i>Vespericola pressleyi</i>

Table 3. Species dropped from detailed analysis

Group / Common name	Scientific Name	Reason(s) for Dropping
Birds		

Yellow rail	<i>Coturnicops noveboracensis</i>	Outside of range
Mammals		
North America wolverine	<i>Gulo gulo luscus</i>	Outside of range
Amphibians		
Northern red-legged frog	<i>Rana aurora aurora</i>	Outside of range
Cascades frog	<i>Rana cascadae</i>	Outside of range
Shasta salamander	<i>Hydromantes shastae</i>	Outside of range
Terrestrial Invertebrates		
Shasta sideband snail	<i>Monadenia troglodytes troglodytes</i>	Outside of range
Wintu sideband snail	<i>Monadenia troglodytes wintu</i>	Outside of range
Shasta chaparral snail	<i>Trilobopsis roperi</i>	Outside of range
Tehama chaparral snail	<i>Trilobopsis tehemana</i>	Outside of range
Shasta hesperian snail	<i>Vespericola Shasta</i>	Outside of range
Aquatic Invertebrates		
California floater	<i>Anodonta californiensis</i>	Outside of range
Nugget pebblesnail	<i>Fluminicola seminalis</i>	Outside of range
Black juga (snail)	<i>Juga nigrina</i>	Outside of range
Scalloped juga (snail)	<i>Juga (Calibasis) occata</i>	Outside of range
Kneecap lanx (limpet)	<i>Lanx patelloides</i>	Outside of range
Montane peaclam	<i>Pisidium ultramontanum</i>	Outside of range

Direct, indirect, and cumulative effects for each alternative are discussed for the species analyzed in detail. Direct effects are those that result in physical harm or death to individuals, or the disruption of reproduction or other key behaviors. Indirect effects include impacts to suitable habitat and effects that occur later in time such as a shift in prey base used by a species, invasion by other species as a result of the project, or other changes to essential habitat characteristics.

AFFECTED ENVIRONMENT

Vegetative communities in the project area vary from late-seral Klamath mixed-conifer, ponderosa pine, and oak woodlands, to early-seral stands and single storied plantations. A large portion of the project area has not experienced fire in over 100 years, therefore fuel conditions are capable of producing high-intensity fire behavior and fire effects. The plantations proposed for treatment are currently overgrown and overstocked, increasing the risk of mortality from insects, disease and wildfire. The plantations are lacking suitable wildlife habitat due to their young age, relatively small diameter trees and high tree densities that raptors could not fly through. Many of the plantations are also dominated by ponderosa pine and/or contain a high density of understory trees and shrubs. Outside of the plantations, forest types/conditions range from areas that are dominated by brush and/or ponderosa pine with relatively open canopies to areas containing mature mixed-conifer forest with high canopy cover and large trees. The units outside of plantations, as well as the adjacent stands, contain some suitable wildlife habitat. The most common vegetation types include mixed conifers in the overstory, oaks and other hardwoods in the understory, and shrubs, forbs, and grasses as ground cover. Mixed conifer forests in the action area are typically dominated by Douglas-fir.

ENVIRONMENTAL CONSEQUENCES

Northern goshawk (*Accipiter gentilis*)

Species Account

The northern goshawk is a widely distributed predator inhabiting boreal and temperate forests throughout the northern hemisphere (Shuford and Garaldi 2008). In North America it breeds throughout Alaska and Canada, and the mountains of the eastern and western US (Squires and Kennedy 2006). Northern goshawks primarily occupy mid- and high-elevation ponderosa pine, mixed-species, and spruce-fir forests, often with little understory vegetation, on flat or moderately sloping terrain. Although they nest in a variety of habitat types, goshawks prefer even-aged mature forests with large trees and open understories. Nest sites tend to be in large trees associated with water and riparian corridors (Squires and Reynolds 1997, Squires and Kennedy 2006, Zeiner *et al.* 1990). Saunders (1982, in USDI Fish and Wildlife Service 1998) found mean diameter of nest trees on the Shasta-Trinity National Forest was 29 inches. Eggs are typically laid in mid-April to early May and incubation lasts about 30 days. Nestlings remain in the nest for 36-42 days, typically fledging between late June and late July (Squires and Reynolds 1997).

Northern goshawks forage in an array of habitats, preying primarily on birds and small mammals (Squires and Reynolds 1997; Reynolds *et al.* 1992). Foraging habitats typically contain abundant large snags and logs for prey habitat and plucking posts (Squires and Reynolds 1997). In the southern Cascades, goshawks prefer to forage in mature and older stands with canopy closure greater than 40 percent. However, early-successional patches and openings also provide foraging opportunities. Reynolds *et al.* (1992) determined that small and medium sized openings (less than four acres) likely enhance prey availability, whereas larger openings are less favorable for most goshawk prey species. Important prey for goshawks in California include squirrels (chipmunks, Douglas, golden-mantled ground, gray, northern flying), Steller's jays, grouse (ruffed and blue), and northern flickers. Squirrels occur in most goshawk diets due to their high abundance and broad distribution (USDI Fish and Wildlife Service 1998). Accounts of home range sizes in the scientific literature for this species vary widely, but an analysis area 1.3 miles around proposed treatments is likely to encompass the typical home range of goshawks in this region based on data in the literature cited above for this species.

Forested conditions suitable for nesting are not present within the plantations but habitat is present in portions of the proposed road and plantation buffers outside of plantations. Numerous historic goshawk sightings have been recorded in the action area. Seven detections occurred within proposed treatment units; however, six of those occurred between 1972-1999 and only one occurred more recently, in 2015. In 2015, a goshawk was observed flying overhead on one occasion but was never found again on subsequent searches. There are only two known goshawk territories within the 1.3 mile analysis area; however these territories have not been active since 1994. No nests (or nesting pairs) have been found within the analysis area. In keeping with Forest Plan requirements (Forest Plan, pages 4-30 and 4-44), if a goshawk nest is found within or near proposed units, it will be protected from disturbance during the goshawk breeding season using the Seasonal Restriction (SR)⁴ described in the project resource protection measures (RPMs) and below.

⁴ SR=Seasonal restrictions, also known as limited operating periods (LOPs), refer to the period of time when operations are limited or restricted. It occurs during times when species are more sensitive to disturbance.

Direct and Indirect Effects

Proposed Action (Alternative 2)

Project activities may cause intermittent disturbance to goshawks within or near treatment areas, and individual goshawks may move away from treatment areas temporarily during project implementation due to the presence of humans and equipment. The STNF Forest Plan requires protection of known goshawk nest sites (Forest Plan pages 4-30 and 4-44). To this end, a SR will be imposed from February 1 through August 15 within 0.25 miles of any known goshawk nest sites in the project area to avoid potential disturbance at these sites during the goshawk breeding season. Currently, there are no known or historic nest sites within 0.25 miles. A SR has also been incorporated into the RPMs to avoid disturbance to northern spotted owls (NSO) during their breeding season. This will apply to activities manipulating NSO habitat or producing loud and continuous noise or smoke that could potentially disturb spotted owls. As a result, where/when the NSO SRs are applied, disturbance to breeding northern goshawks will be reduced as their breeding seasons overlap and in many areas, their habitats overlap. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix A.

Potential disturbance to goshawks is limited due to the narrow width of the proposed treatment areas along roads and plantations. As a result, although some goshawks may be affected by noise disturbance, the potential to cause direct mortality, harm, or significant disruption to normal behaviors of goshawks, especially during their breeding season, is very limited.

Effects to goshawk habitat is limited due to the narrow width of the proposed treatment areas along roads and plantations. The plantations themselves do not provide suitable goshawk habitat. Habitat suitability in the buffers will be negatively affected by cutting and removal of trees, which would reduce canopy cover and abundance of large trees, and fuels treatments that reduce coarse woody debris (CWD). These treatments will potentially affect habitats beneficial to goshawk prey species, and may reduce the availability of perching sites for foraging goshawks. However, these treatments will also open up the understory which may improve goshawk access to prey in overgrown areas. The potential for indirect effects is limited due to the following factors:

1. Project RPMs include retention of CWD, including large snags and logs. Snags and logs with deformities such as cat faces, broken or forked tops, hollows or cavities will be prioritized for retention (Appendix A).
2. The project is designed to maintain high value NSO habitat, thus also maintaining the highest quality goshawk habitat.
3. The best, healthiest trees that have a high canopy capacity will be retained.
4. Treatments are designed to create ecological conditions that are more resilient to insect and disease outbreaks and wildfire over the long-term. Therefore, treatments will help protect remaining goshawk habitat.
5. Treatments are along open Forest Service roads, where disturbance due to traffic noise is already present to some degree and where goshawks are less likely to nest.

In summary, potential effects to goshawks are very limited.

Alternative 3

This alternative would occur within the same boundaries and have the same treatments as the Proposed Action (Alternative 2); however, there would be no machine piling or mastication anywhere, no use of dozers for control line preparation anywhere, and no mechanical equipment use in Riparian Reserve (RR) land allocations.

The direct and indirect effects of Alternative 3 on goshawks will be similar to those of the Proposed Action and the same number of acres will be affected. However, treatments will cause less intense ground disturbance and noise disturbance, and likely impact less understory vegetation and CWD due to the limitations on mechanical equipment in this alternative. Thus, impacts to CWD and goshawk prey species/habitat will likely be less than the Proposed Action. Potential disturbance to goshawks due to noise will also be reduced. However, the potential for goshawk habitat loss due to high-intensity wildfire will likely be higher because fuels treatments may be less effective.

Alternative 4

This alternative would occur within the same boundaries as the Proposed Action (Alternative 2); however, no trees with DBH greater than 18 inches would be cut in the buffers, unless it is a hazard. Snags greater than (>) 18 inches would be retained in LSR and RR when not deemed a hazard to roads, landings, or operations. Snags that are determined to be hazards will be felled.

The prescriptions in the areas along roads and around plantations for this alternative are different than Alternative 2. The prescription in all buffers would thin smaller trees (“thin from below”) up to the 18-inch diameter limit. The prescriptions for plantations will be the same as described in Alternative 2.

The direct and indirect effects of Alternative 4 on goshawks will be similar to those of the Proposed Action and the same number of acres will be affected. However, impacts to goshawk habitat will be less under this alternative because more large trees will be retained. This would be the least impactful alternative for this species in the short term. However, the potential for goshawk habitat loss due to high-intensity wildfire or insect/disease outbreaks may be higher because trees will be more crowded and fuels treatments may be less effective.

Direct and Indirect Effects Determination

It is my determination that the proposed action and all other action alternatives may affect individual northern goshawks, but potential effects to the reproduction and population demography of this species are limited and insignificant, and will not cause a trend toward listing.

Willow flycatcher (*Empidonax traillii*)

Species Account

Willow flycatchers breed from Maine to British Columbia, and south through California and southern Arizona (Sedgwick 2000, Craig and Williams 1998, Timossi *et al.* 1995). Sedgwick (2000) quoted Grinnell and Miller (1944) as concluding that in California this species is “strikingly restricted to thickets of willows, whether along streams in broad valleys, in canyon bottoms, around mountain-side seepages, or at the margins of ponds and lakes.” Today this species is absent from most of California, with currently known breeding locations restricted primarily to the Sierra Nevada/Cascade region (southeast Shasta County south to north Kern County, including Alpine, Inyo, and Mono Counties), and Santa Barbara, Riverside, and San Diego Counties (Sedgwick 2000).

Breeding habitat is typically moist meadows with perennial streams, lowland riparian woodlands dominated by cottonwood and willows (primarily in tree form), or smaller spring-fed or boggy areas with willows or other wetland plants. Deciduous riparian shrubs or trees are essential elements in willow flycatcher territories. Complex (multi-story) canopies and openings are also important components of nesting habitat (Craig and Williams 1998; Sedgwick 2000). Willow flycatchers generally do not occupy areas with dense tree cover, although they will use scattered

trees for singing and foraging perches. Their diet consists almost exclusively of flying insects (Craig and Williams 1998). A buffer width of 50 feet (15 meters) on each side of streams was established as the typical likely extent of potential willow flycatcher habitat, and defines the analysis area for this species in this report. This area is appropriate because it encompasses the typical likely extent of potentially suitable habitat conditions for this species along the streams in the project area. The nearest recorded observation is approximately 650 feet (200 meters) from proposed treatment units; however there are no observations within units. Willow thickets and true riparian vegetation is generally lacking from the project units.

Direct and Indirect Effects

Proposed Action (Alternative 2)

Willow flycatchers are not known or expected to occur within project units due to lack of dense willows and riparian vegetation sufficient to support this species. Project activities may cause intermittent noise disturbance to willow flycatchers within or near treatment areas, and individual willow flycatchers may move away from treatment areas temporarily during project implementation due to the presence of humans and equipment. However, potential disturbance would be limited due to the narrow width of the proposed treatment areas along roads and plantations. As a result, although some willow flycatchers may be affected by noise disturbance, the potential to cause direct mortality, harm, or significant disruption to normal behaviors of willow flycatchers, especially during their breeding season, is very unlikely. A SR has been incorporated into the RPMs to avoid disturbance/harm to NSO during their breeding season. This will apply to activities manipulating NSO habitat or producing loud and continuous noise or smoke that could potentially disturb NSO. As a result, where/when the NSO SRs are applied, disturbance to breeding willow flycatchers will be reduced in some locations as their breeding seasons overlap. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix A.

The potential for willow flycatcher habitat alteration/impacts is very limited. The project is designed to have less intense treatments within riparian reserves (RRs), which is where willow flycatcher habitat would occur. Within RRs, all true-riparian vegetation will be retained. Outside of plantations, all conifer trees over 8 inches DBH will also be retained in RRs. Within RRs, equipment exclusion zones (EEZs) will be utilized to avoid impacts to riparian vegetation, soils, and to retain trees necessary for shading, bank stabilization and as a source of future large woody debris. EEZs will be at least 50 feet on each side of streams, which would encompass the willow flycatcher analysis area and potential habitat, as defined above. The only treatment type that may impact riparian vegetation is prescribed fire. However, within riparian reserves, fire will mostly be low intensity and is not expected to completely remove riparian vegetation. Extensive resource protection measures (RPMs) for RRs (see Appendix A) will further prevent potential effects to this species and its habitat.

In summary, potential effects to willow flycatchers are very limited.

Alternative 3

This alternative would occur within the same boundaries and have the same treatments as the Proposed Action (Alternative 2); however, there would be no machine piling or mastication anywhere, no use of dozers for control line preparation anywhere, and no mechanical equipment use in Riparian Reserve (RR) land allocations.

The direct and indirect effects of Alternative 3 on willow flycatchers will be similar to those of the Proposed Action and the same number of acres will be affected. For all alternatives, including the Proposed Action, true-riparian plant species will be retained and EEZs already exist. However, treatments will cause less intense noise disturbance due to the limitations on

mechanical equipment in this alternative. Thus, impacts to willow flycatchers will likely be less than the Proposed Action.

Alternative 4

This alternative would occur within the same boundaries as the Proposed Action (Alternative 2); however, no trees with DBH greater than 18 inches would be cut in the buffers, unless it is a hazard. Snags greater than (>) 18 inches would be retained in LSR and RR when not deemed a hazard to roads, landings, or operations. Snags that are determined to be hazards will be felled.

The prescriptions in the areas along roads and around plantations for this alternative are different than Alternative 2. The prescription in all buffers would thin smaller trees (“thin from below”) up to the 18-inch diameter limit. The prescriptions for plantations will be the same as described in Alternative 2.

The direct and indirect effects of Alternative 4 on willow flycatchers will be the same as those of the Proposed Action and the same number of acres will be affected. For all alternatives, including the Proposed Action, true-riparian plant species will be retained, EEZs already exist, and outside of plantations there is already a diameter limit within RRs.

Direct and Indirect Effects Determination

It is my determination that the proposed action and all other action alternatives may affect individual willow flycatchers, but potential effects to the reproduction and population demography of this species are limited and insignificant, and will not cause a trend toward listing.

Bald eagle (*Haliaeetus leucocephalus*)

Species Account

Bald eagles typically utilize large trees protected from disturbance for nesting, and late successional and old growth forests close to large rivers or lakes for winter roosting sites. Their primary food source is fish, which are taken live or as carrion (USDI Fish and Wildlife Service 2013; Anthony *et al.* 1992; USDI Fish and Wildlife Service 1986). Average home range sizes in Oregon and Washington, respectively, were 1,650 and 1,216 acres (Snyder 1993, Kalasz and Buchanan 2016). In northern California, courtship and nest initiation can begin as early as January and eggs are typically laid between late February and late March. After about 35 days of incubation, the eggs hatch and nestlings remain in the nest for about 12 weeks until they are fully fledged and take their first flight. Fledging occurs by late July (Jackson and Jenkins 2004).

On the Shasta-Trinity National Forest, many large conifers provide potential nest sites on slopes overlooking Trinity Lake, Lewiston Lake, the Trinity River, South Fork Trinity River, and major tributaries such as Hayfork Creek. The analysis area for this species is a 1 mile buffer around proposed treatment units. This bounding is appropriate because it is likely to encompass the typical home range of bald eagles in this region, based on data in the literature cited above for this species.

Conditions suitable for nesting, roosting or foraging by bald eagles are not present within or near the project units. The project area is lacking large fish-bearing waterbodies. The nearest potentially suitable foraging/nesting habitat is along Hayfork Creek and the South Fork Trinity River, both approximately 2 miles away. According to wildlife databases, there are no bald eagle observations within the analysis area. The nearest bald eagle observation and known historic nest is approximately 3 miles to the west, along the South Fork Trinity River.

Direct and Indirect Effects

Based on a lack of nesting and foraging habitat, as described above, potential effects to bald eagles and their habitat are not expected. Bald eagles are not expected to occur within the analysis area.

The STNF Forest Plan requires protection of known bald eagle nest sites. To this end, if a bald eagle nest is found, a SR will be imposed from January 1 through July 31 within 0.25 miles of the nest to avoid potential disturbance at these sites during the bald eagle breeding season. As described above, there are no known bald eagle nest sites within 0.25 miles of the project units.

Direct, Indirect & Cumulative Effects Determination

It is my determination that the proposed action and all other action alternatives will not affect bald eagles.

Pallid bat (*Antrozous pallidus*)

Species Account

The pallid bat has a wide distribution throughout the western United States, and can be abundant in many arid, low elevation regions (Sherwin and Rambaldini 2005; California Department of Fish and Wildlife 2020). They occur throughout California except in the high elevation Sierra Nevada from Shasta to Kern counties, and the northwestern corner of the state from Del Norte and western Siskiyou Counties to northern Mendocino County (California Department of Fish and Wildlife 2020). Summer roost sites are in cavities in live trees or snags, deep crevices in rock faces, caves, mines and bridges, and occasionally in open buildings (Baker *et al.* 2008). This species feeds primarily on the ground, commonly preying on crickets, grasshoppers, beetles and scorpions. They generally forage in open areas with limited ground cover (Rambaldini and Brigham 2011).

Keinath (2003) found that for insectivorous bats “the concept of home range is not clearly applicable to bat ecology, given the mobility of bats and the apparent plasticity of foraging areas with respect to prey abundance.” The analysis area used in this report for northern goshawks and pacific fishers (1.3 mi. around proposed treatments), both larger and very mobile species, will be used here to conservatively estimate an appropriate scale on which to assess potential effects to this species. This area is appropriate because it is large enough to consider the short distances that bats likely typically travel between roost, hibernation and foraging sites on a regular basis.

Wildlife databases show no observations of pallid bats within the action area. The nearest recorded observation is approximately 12 miles southeast from the project units. Some habitats in the project area may be suitable for this species.

Direct and Indirect Effects

Proposed Action (Alternative 2)

Pallid bats may use large trees, snags, bridges, caves, or mines in or near the project area. Bridges will not be impacted and no project activities are planned within 250 feet of caves or mines. The nearest cave is approximately 1 mile from proposed units.

Project activities may cause intermittent disturbance to pallid bats within or near treatment areas, and individual pallid bats may move away from treatment areas temporarily during project implementation due to the presence of humans and equipment. This may increase exposure to predation, but any increase in predation resulting from these activities is likely to be limited and

short in duration. Potential disturbance to bats is limited due to the narrow width of the proposed treatment areas along roads and plantations. As a result, although some pallid bats may be affected by noise disturbance, the potential to cause direct mortality, harm, or significant disruption to normal behaviors of pallid bats, especially during their breeding season, is very limited.

Habitat suitability may be negatively affected by project activities. Cutting trees will remove some potential roost sites. Although trees and snags will be cut during project activities, they do not have the structure suitable for maternity colonies. Therefore, disturbance of these structures may result in temporary displacement of bats to alternative day roost sites, but is unlikely to impact breeding individuals. Fuels reduction treatments will reduce CWD that may be useful as a habitat component for pallid bat prey species. However, RPMs for the project include retention of CWD, including large snags and logs. Snags and logs with deformities such as cat faces, broken or forked tops, hollows or cavities will be prioritized for retention (Appendix A).

Although direct harm could potentially result from felling tree and snags, the potential extent of direct effects is limited. Pallid bat preferred roosting sites such as caves, mines and bridges will not be impacted, which greatly reduces the potential for direct effects to this species. RPMs specific to caves, mines and bats are included in Appendix A. The SR incorporated into the RPMs to avoid disturbance to NSO during their breeding season will also reduce potential direct effects as well as noise/smoke disturbance to pallid bats during their breeding season, where/when it is applied. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix A.

In summary, potential effects to pallid bats are very limited.

Alternative 3

This alternative would occur within the same boundaries and have the same treatments as the Proposed Action (Alternative 2); however, there would be no machine piling or mastication anywhere, no use of dozers for control line preparation anywhere, and no mechanical equipment use in Riparian Reserve (RR) land allocations.

The direct and indirect effects of Alternative 3 on pallid bats will be very similar to those of the Proposed Action and the same number of acres will be affected. However, treatments will cause less intense ground disturbance and noise disturbance, and likely impact less understory vegetation and CWD due to the limitations on mechanical equipment in this alternative. Thus, impacts to pallid bats and the habitat of their prey will likely be less than the Proposed Action. However, the potential for bat habitat loss due to high-intensity wildfire may be higher because fuels treatments may be less effective.

Alternative 4

This alternative would occur within the same boundaries as the Proposed Action (Alternative 2); however, no trees with DBH greater than 18 inches would be cut in the buffers, unless it is a hazard. Snags greater than (>) 18 inches would be retained in LSR and RR when not deemed a hazard to roads, landings, or operations. Snags that are determined to be hazards will be felled.

The prescriptions in the areas along roads and around plantations for this alternative are different than Alternative 2. The prescription in all buffers would thin smaller trees ("thin from below") up to the 18-inch diameter limit. The prescriptions for plantations will be the same as described in Alternative 2.

The direct and indirect effects of Alternative 4 on pallid bats will be similar to those of the Proposed Action and the same number of acres will be affected. However, impacts to pallid bats and their habitat will be less under this alternative because more large trees and snags will be retained. This would be the least impactful alternative for pallid bats in the short term. However,

the potential for pallid bat habitat loss due to high-intensity wildfire or insect/disease outbreaks may be higher because trees will be more crowded and fuels treatments may be less effective.

Direct and Indirect Effects Determination

It is my determination that the proposed action and all other action alternatives may affect individual pallid bats, but potential effects to the population demography of this species are limited and insignificant, and will not cause a trend toward listing.

Townsend's big-eared bat (*Corynorhinus townsendii*)

Species Account

This species occurs in the western and southeastern United States and in southern British Columbia, with isolated populations on the Southern Plains and southward to Mexico. It is found throughout California from low desert to mid elevation montane habitats and is most abundant in mesic habitats (Zeiner *et al.* 1990). It occupies a variety of habitats ranging from coniferous forests and woodlands to deciduous riparian woodlands, semi-desert and montane shrub habitats. Townsend's big-eared bats are strongly correlated with the availability of caves and cave-like roosting habitat, although they occasionally make use of man-made structures such as abandoned buildings and bridges (USDA Forest Service 1998; Zeiner *et al.* 1990). Townsend's big-eared bats are very sensitive to disturbance at roost sites, and may abandon sites following a single disturbance (Zeiner *et al.* 1990). This species feeds primarily on small moths. It prefers foraging along edges of riparian vegetation where conifers and deciduous riparian species support lepidopteran prey species, and tends to avoid foraging in open areas (Fellers and Pierson 2002, Gruver and Keinath 2006). For the reasons listed above in the pallid bat analysis, the analysis area for this species is all lands within 1.3 miles of the proposed treatments.

Wildlife databases show observations of Townsend's big-eared bats in caves that are approximately 1 mile west of proposed units.

Direct and Indirect Effects

Townsend's big-eared bats may use caves or mines near the project area. However, no project activities are planned within 250 feet of caves or mines and no bridges would be impacted. The nearest cave is approximately 1 mile from proposed units, and according to the CNDDDB, this species has been observed there. Project implementation would not impact any potential roost sites or reproductive sites and there would be no habitat alteration. In addition, true riparian vegetation will be retained and there are extensive RPMs for riparian areas. RPMs specific to caves, mines and bats are included in Appendix A. As a result, direct and indirect effects to Townsend's big-eared bats will not occur.

In summary, potential effects to Townsend's big-eared bats are not expected.

Direct, Indirect & Cumulative Effects Determination

It is my determination that the proposed action and all other action alternatives will not affect Townsend's big-eared bats.

Fringed myotis (*Myotis thysanodes*)

Species Account

The fringed myotis is a predominantly western bat species occurring from southern British Columbia south through southern Mexico, with an isolated population in the Black Hills of South Dakota and Wyoming. They are generally found between 3,000 and 5,000 feet in elevation, but also inhabit lower elevations near coastal areas. This species is rare in California, but is found throughout the state, from the coast to 5,900 feet or greater in elevation in the Sierra Nevadas (Keinath 2003). They occur within a broad range of vegetative types but are mostly reported to occur in pinyon juniper, oak, ponderosa pine and mixed conifer forest types (Keinath 2004).

This species often forages along small streams (Pierson *et al.* 2001). Fringed myotis bats living in temperate forests must drink water shortly after emerging from their day roosts each evening, and may require up to half their body weight in water each day depending on the type of prey consumed (Christy and West 1993; Keinath 2004). Consequently, they are generally found to roost in areas within close proximity to a water source, though the size and extent of that source can be highly variable. The limited information available on its diet indicates they consume primarily beetles, supplemented by moths and fly larvae captured in the air or on foliage (Keinath 2004). Fringed myotis are morphologically adapted to forage in areas of relatively high vegetative diversity such as interior forests and/or their edges, but not in wide openings such as clear-cuts or meadows where their chief prey taxa (coleopterans) would be less abundant (Pierson *et al.* 2001).

Fringed myotis will use caves, mines, and buildings as solitary day/night roosts and hibernacula. They may also use bridges and rock crevices as solitary day/night roosts (Christy and West 1993). Weller and Zabel (2001) found that many day and night roosts in northern California were under tree bark and in tree hollows, and medium to large diameter snags provided important day and night roosting sites for this species. However, Lacki and Baker (2007) found that fringed myotis in Oregon and Washington use trees/snags as roosts much less than previously reported and instead favored caves, mines, and buildings as solitary day and night roosts and hibernacula. Roosts in more permanent structures such as bridges and rock crevices elicit high roost fidelity compared to more temporary roosts such as trees and snags (Lewis 1995, Weller and Zabel 2001). Maternity colonies have been documented in caves, mines, abandoned buildings, bridges, and rock crevices, and can range in size from a few dozen bats to several hundred (Keinath 2004, Keinath 2003). Like many cave roosting species, fringed myotis colonies are susceptible to disturbance in hibernacula and maternal colonies. Few hibernacula have been well documented, but those that have are generally cool and usually in caves or mines with little temperature fluctuation throughout the winter (Keinath 2004, Keinath 2003). For the reasons listed above in the pallid bat analysis, the analysis area for this species is all lands within 1.3 miles of proposed treatments.

Wildlife databases show no observations of fringed myotis bats within the action area. The nearest recorded observation is approximately 10 miles to the NW. Some habitats in the project area may be suitable for this species.

Direct and Indirect Effects

Fringed myotis bats may use large trees, snags, bridges, buildings, caves, or mines in or near the project area. No project activities are planned within 250 feet of caves or mines and no bridges or buildings would be impacted. The nearest cave is approximately 1 mile from proposed units.

Project activities may cause intermittent disturbance to fringed myotis bats within or near treatment areas, and individual bats may move away from treatment areas temporarily during project implementation due to the presence of humans and equipment. This may increase exposure to predation, but any increase in predation resulting from these activities is likely to be limited and short in duration. Potential disturbance to bats is limited due to the narrow width of

the proposed treatment areas along roads and plantations. As a result, although some bats may be affected by noise disturbance, the potential to cause direct mortality, harm, or significant disruption to normal behaviors of fringed myotis bats, especially during their breeding season, is very limited.

Habitat suitability may be negatively affected by project activities. Cutting trees may remove some potential roost sites. Although trees and snags will be cut during project activities, they do not have the structure suitable for maternity colonies. Therefore, disturbance of these structures may result in temporary displacement of bats to alternative day roost sites, but is unlikely to impact breeding individuals. Fuels reduction treatments will reduce CWD that may be useful as a habitat component for fringed myotis bat prey species. However, RPMs for the project include retention of CWD, including large snags and logs. Snags and logs with deformities such as cat faces, broken or forked tops, hollows or cavities will be prioritized for retention (Appendix A).

Although direct harm could potentially result from felling tree and snags, the potential extent of direct effects is limited. Fringed myotis bat preferred roosting sites such as caves, mines and bridges will not be impacted, which greatly reduces the potential for direct effects to this species. RPMs specific to caves, mines and bats are included in Appendix A. The SR incorporated into the RPMs to avoid disturbance to NSO during their breeding season will reduce potential direct effects as well as noise/smoke disturbance to fringed myotis bats during their breeding season, where/when it is applied. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix A. Fringed myotis tend to move to lower and more southerly hibernacula in the fall months (Keinath 2003) and may leave the project area entirely by the time these areas are treated.

In summary, potential effects to fringed myotis bats are very limited.

Alternative 3

This alternative would occur within the same boundaries and have the same treatments as the Proposed Action (Alternative 2); however, there would be no machine piling or mastication anywhere, no use of dozers for control line preparation anywhere, and no mechanical equipment use in Riparian Reserve (RR) land allocations.

The direct and indirect effects of Alternative 3 on fringed myotis bats will be very similar to those of the Proposed Action and the same number of acres will be affected. However, treatments will cause less intense ground disturbance and noise disturbance, and likely impact less understory vegetation and CWD due to the limitations on mechanical equipment in this alternative. Thus, impacts to fringed myotis bats and the habitat of their prey will likely be less than the Proposed Action. However, the potential for bat habitat loss due to high-intensity wildfire may be higher because fuels treatments may be less effective.

Alternative 4

This alternative would occur within the same boundaries as the Proposed Action (Alternative 2); however, no trees with DBH greater than 18 inches would be cut in the buffers, unless it is a hazard. Snags greater than (>) 18 inches would be retained in LSR and RR when not deemed a hazard to roads, landings, or operations. Snags that are determined to be hazards will be felled.

The prescriptions in the areas along roads and around plantations for this alternative are different than Alternative 2. The prescription in all buffers would thin smaller trees ("thin from below") up to the 18-inch diameter limit. The prescriptions for plantations will be the same as described in Alternative 2.

The direct and indirect effects of Alternative 4 on fringed myotis bats will be similar to those of the Proposed Action and the same number of acres will be affected. However, impacts to fringed myotis bats and their habitat will be less under this alternative because more large trees and snags

will be retained. This would be the least impactful alternative for fringed myotis bats in the short term. However, the potential for bat habitat loss due to high-intensity wildfire or insect/disease outbreaks may be higher because trees will be more crowded and fuels treatments may be less effective.

Direct and Indirect Effects Determination

It is my determination that the proposed action and all other action alternatives may affect individual fringed myotis bats, but potential effects to the population demography of this species are limited and insignificant, and will not cause a trend toward listing.

Pacific/American marten (*Martes caurina*, aka *M. americana*)

Species Account

Martens are closely associated with late-successional conifer forests with closed canopies and abundant, complex physical structure at or near the ground. They tend to use higher elevation forest above 4,500 feet and multi-storied mature and old growth conifers (white fir/red fir). Abundant slash, rotten logs, and stumps that provide cover and den sites are preferred habitat (Buskirk and Zielinski 1997; Krohn *et al.* 1997; Small *et al.* 2003). Abundant downed woody material also provides protection from predators, access to the subnivean (under snow) environment for hunting and resting, and thermal protection from heat and cold (Ruggiero *et al.* 1994). Lower branches of live trees, tree boles of all age/decay classes, coarse woody debris, shrubs and rock fields/talus slopes and caves can all contribute to structural requirements (Buskirk and Zielinski 1997). Late-successional habitat provides marten with rest and den sites they require, as well as higher density of preferred prey species (Kirk 2007). Martens eat primarily small mammals, lagomorphs, and birds, but also take insects, fruit, and carrion opportunistically (Powell *et al.* 2003). Accounts of home range sizes in the scientific literature for this species vary widely (Stone 2010). Home ranges in the Sierra Nevada Mountains in largely unlogged forest landscapes averaged 1.2–1.9 mi² for males and 1.2–1.5 mi² for females, and similar home range estimates were reported in coastal areas of California and Oregon (USDI Fish and Wildlife Service 2015). The analysis area for this species is all lands within 1.3 miles of proposed treatments.

Our records show no detections of American martens in or near the project area. The nearest recorded observation is approximately 24 miles to the northeast (according to the CNDDDB). The majority of the project is lower than 4,500 feet elevation; however, the project area may include some habitat suitable for this species in the higher-elevation areas.

Direct and Indirect Effects

Proposed Action (Alternative 2)

If martens do use the higher elevations in the project area, project activities may cause intermittent disturbance to martens within or near treatment areas, and individual martens may move away from treatment areas temporarily during project implementation due to the presence of humans and equipment. Intermittent disturbance may cause some shifting of foraging or resting behavior, but it is unlikely to be sufficiently adverse to lead to disturbances in breeding behavior for this species. A SR has been incorporated into the RPMs to avoid disturbance to NSO during their breeding season. This will apply to activities manipulating NSO habitat or producing loud and continuous noise or smoke that would potentially disturb NSO. These protection

measures, when/where they are applied, will also decrease potential direct effects to martens during their denning season. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix A.

Potential disturbance to martens is limited due to the narrow width of the proposed treatment areas along roads and plantations. The plantations do not contain suitable marten habitat therefore potential habitat and habitat alteration is limited to the treatment units outside of plantations. Habitat suitability will be negatively affected by cutting and removal of trees, and fuels treatments that reduce coarse woody debris (CWD). These treatments will potentially affect habitats beneficial to marten and their prey species. However, the potential for indirect effects is limited due to the following factors:

1. Project RPMs include retention of CWD, including large snags and logs. Snags and logs with deformities such as cat faces, broken or forked tops, hollows or cavities will be prioritized for retention (Appendix A).
2. The project is designed to maintain high value NSO habitat, thus also maintaining the highest quality marten habitat.
3. The best, healthiest trees that have a high canopy capacity will be retained.
4. Treatments are designed to create ecological conditions that are more resilient to insect and disease outbreaks and wildfire over the long-term. Therefore, treatments will help protect remaining marten habitat.
5. Treatments are along open Forest Service roads, where disturbance due to traffic noise is already present to some degree and where martens are unlikely to den, forage, or rest.

Although some martens may be affected by noise disturbance, the potential to cause direct mortality, harm, or significant disruption to normal behaviors of martens, especially during their breeding season, is very limited.

In summary, potential effects to martens are very limited.

Alternative 3

This alternative would occur within the same boundaries and have the same treatments as the Proposed Action (Alternative 2); however, there would be no machine piling or mastication anywhere, no use of dozers for control line preparation anywhere, and no mechanical equipment use in Riparian Reserve (RR) land allocations.

The direct and indirect effects of Alternative 3 on martens will be similar to those of the Proposed Action and the same number of acres will be affected. However, treatments will cause less intense ground disturbance and noise disturbance, and likely impact less understory vegetation and CWD due to the limitations on mechanical equipment in this alternative. Thus, impacts to martens, their habitat and prey species/habitat will likely be less than the Proposed Action. Potential disturbance to martens due to noise will also be reduced. However, the potential for marten habitat loss due to high-intensity wildfire will likely be higher because fuels treatments may be less effective.

Alternative 4

This alternative would occur within the same boundaries as the Proposed Action (Alternative 2); however, no trees with DBH greater than 18 inches would be cut in the buffers, unless it is a hazard. Snags greater than (>) 18 inches would be retained in LSR and RR when not deemed a hazard to roads, landings, or operations. Snags that are determined to be hazards will be felled.

The prescriptions in the areas along roads and around plantations for this alternative are different than Alternative 2. The prescription in all buffers would thin smaller trees ("thin from below") up

to the 18-inch diameter limit. The prescriptions for plantations will be the same as described in Alternative 2.

The direct and indirect effects of Alternative 4 on martens will be similar to those of the Proposed Action and the same number of acres will be affected. However, impacts to martens and their habitat will be less under this alternative because more large trees and snags will be retained. This would be the least impactful alternative for this species. However, the potential for marten habitat loss due to high-intensity wildfire will likely be higher because trees may be more crowded and fuels treatments may be less effective.

Direct and Indirect Effects Determination

It is my determination that the proposed action and all alternatives may affect individual Pacific martens, but potential effects to the population demography of this species are very limited and insignificant, and will not cause a trend toward listing.

Fisher (*Pekania pennanti*)

Listing History/Background

On April 8, 2004, the US Fish and Wildlife Service (USFWS) published a 12-month finding in the Federal Register stating that listing the West Coast Distinct Population Segment (DPS) of the fisher under the Endangered Species Act (ESA) was warranted, but precluded by other higher priority listing actions (USDI FWS 2004). The FWS defined the West Coast DPS of fisher as: the Cascade Mountains and all areas west to the coast in Oregon and Washington; the North Coast from Mendocino County, California, north to Oregon; east across the Klamath, Siskiyou, Trinity, and Marble mountains, and across the southern Cascade Mountains; and south through the Sierra Nevada. On October 7, 2014, the USFWS published a proposed rule in the Federal Register to list the West Coast DPS of fisher as Threatened (USDI FWS 2014). On April 18, 2016, the USFWS withdrew its October 7, 2014 proposed rule (USDI FWS 2016a). On September 21, 2018, the District Court for the Northern District of California vacated the April 2016 withdrawal, and the Federal listing status of the West Coast DPS of fisher returned to "Proposed Threatened." In 2019, a Revised Proposed Rule delineated two subpopulations of the West Coast DPS: the Northern California/Southern Oregon and the Southern Sierra Nevada subpopulations. On May 15, 2020 the Final Rule was published in the Federal Register stating that listing the Northern California/Southern Oregon DPS of fisher is not warranted. The Southern Sierra DPS was listed as endangered (USDI FWS, 2020). Since the fisher is now only a Forest Service Sensitive Species it is solely included in this BE. The analysis in this BE addresses the project impacts to individuals in the project area, and its viability at the Forest scale.

Species Account

Fishers in western North America are often associated with complex vertical and horizontal structural elements typical of late-successional forests, including large trees, snags, logs, and dense canopy (Raley *et al.* 2012). Contrary to earlier conclusions based on limited work, they are not dependent upon old-growth conifer forests for survival, although such conditions can provide high-quality habitats (Raley *et al.* 2012). At a landscape scale, fisher typically occupy a mosaic of forest types and seral stages, generally with high proportions of mid- and late-seral forest and low proportions of open or non-forested habitats. They appear to be obligate cavity users for reproduction, relying on cavities to moderate temperature extremes and provide security for kits from potential predators. They use cavities in live trees or snags to give birth and raise their

young (Aubry and Raley 2006; USFWS 2016b). There is a strong association with hardwoods, particularly black oaks with large-enough cavities that allow for entry of fisher, but preclude predators (Zielinski *et al.* 2004). Mast-producing black oak and tanoak are important for fisher and their prey, particularly along riparian areas (Yaeger 2005). Fishers are relatively large and opportunistic predators. They forage primarily on small mammals, lagomorphs, and birds, but will also eat insects, fruit, carrion, and other items (Powell *et al.* 2003).

Fishers are closely associated with drainage bottoms (Yaeger 2005) and riparian areas, usually selecting resting and denning sites within 300 to 500 feet, and rarely more than 1,100 feet, from water (Self and Kerns 2001). Riparian areas provide important rest site elements, such as broken tops, large snags, and large down wood (Seglund 1995). In forest types subject to frequent fires that remove woody structures near the ground, fishers are closely associated with riparian areas (Powell *et al.* 2003), which typically do not burn as often.

Accounts of home range sizes in the scientific literature for this species are highly variable (USDI Fish and Wildlife Service 2014). Zielinski *et al.* (2004) found average home range size for female fishers in northern California of 980.5 ha (2,422 ac), while males ranged over larger areas (9,722 ac). As a result, home ranges in the project area are likely to be small compared to those reported in some other parts of this species' range. The analysis area for this report consists of all lands within 1.3 miles of the proposed treatment units. This bounding is appropriate because it is likely to encompass the typical home range of reproducing female fishers in this area.

Wildlife databases show numerous remote camera detections and incidental sightings of Pacific fisher in the analysis area, including one observation within a proposed treatment unit in 1997. In 2015, several remote camera detections occurred within 50 feet of proposed units. While there are currently no known fisher den sites within the project area, a seasonal restriction would be implemented if a fisher den site is found. To reduce disturbance to breeding fisher, from March 15 through July 31 project activities that result in loud and continuous noise above ambient levels within 0.25 mile of an active den are restricted. In addition, any burning that would subject active den sites to heavy smoke would also be restricted during the March 15 through July 31 breeding season.

Direct and Indirect Effects

Proposed Action (Alternative 2)

Project activities may cause intermittent disturbance to fishers within or near treatment areas, and individual fishers may move away from treatment areas temporarily during project implementation due to the presence of humans and equipment. Due to the large home range and foraging habits of fishers and the relatively small footprint of the proposed treatments, individual fisher may experience slight changes to their foraging patterns, but project effects are unlikely to negatively impact the ability of individual fishers to successfully forage or disperse across the project area. Intermittent disturbance may cause some shifting of resting behavior, but it is unlikely to be sufficiently adverse to lead to disturbances in breeding behavior for this species.

To reduce disturbance to fisher at den sites, prescribed burning and vegetation management activities will be conducted outside of the denning season (March 15 through July 31) when within 300 feet of a known fisher den site. The Northern spotted owl (NSO) SRs that have also been incorporated into the project RPMs to avoid disturbance to NSO during their breeding season will reduce potential disturbance to fishers during their breeding season, where/when they are applied. These SRs will apply to activities manipulating NSO habitat or producing loud and continuous noise or smoke that would potentially disturb NSO. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix A.

NSO nesting/roosting habitat would have the highest likelihood of fisher use during the reproductive season, as these areas contain the highest canopy closure, highest amounts of snags, large trees, and large downed logs which provide potential areas for denning. The fisher breeding season in California and Oregon generally occurs from late February through early April. Females typically give birth to kits from early March to early April, with variations depending on weather and habitat conditions (Lofroth et al. 2010). Young are mobile and capable of normal locomotion by 10-12 weeks of age (Aubry and Raley 2006). Therefore, by early July to early August, kits are old enough to move away from a source of noise or smoke disturbance. Therefore, where/when the NSO SRs are applied, most project activities would occur after fisher young are out of the den and mobile.

The plantations do not contain suitable fisher habitat therefore potential habitat and habitat alteration is limited to the treatment units outside of plantations. Habitat suitability will be negatively affected by cutting and removal of large trees, which will reduce canopy cover and abundance of large trees, and fuels treatments that will reduce coarse woody debris (CWD) and simplify the understory structure. These treatments will potentially affect habitats beneficial to fisher and their prey species. However, the potential for direct and indirect effects is limited due to the following factors:

1. Project RPMs include retention of specified levels of CWD, including large snags and logs. Snags and logs with deformities such as cat faces, broken or forked tops, hollows or cavities will be prioritized for retention. Those features are important habitat elements for fisher and their prey (Appendix A).
2. The project is designed to minimize treatments in Riparian Reserves (RRs), areas fishers often utilize. RRs will only get an understory, hand treatment. All conifers greater than 8 inches and all riparian species will be retained. This prescription will also be applied to NSO nesting/roosting habitat that is within known NSO core areas and more than 50 feet from a road or plantation edge.
3. Project RPMs include extensive protections in Riparian Reserves including, but not limited to equipment exclusion zones (EEZs). Within riparian reserves, fire will mostly be low intensity and may remove/kill smaller trees, brush and other understory vegetation but is not expected to completely remove vegetation.
4. Prescribed fire (and other fuels treatments) would typically be low to moderate intensity and therefore not expected to impact overstory canopy cover or large trees/snags. Impacts to snags and large downed wood would be very limited. In areas with high fuel loading, higher intensity flare ups could occur, resulting in small pockets of mortality or impacts to large down wood or snags. However, fire-killed trees can be a source of future snags and downed log habitat. In addition, fuels treatments typically result in regeneration of new growth in understory herbaceous vegetation and a subsequent increase in the amount of food and cover for prey species. As a result, these treatments will be beneficial in the long term.
5. The project is designed to maintain high value NSO habitat, thus also maintaining the highest quality fisher habitat.
6. The proposed thinning will promote increased growth and vigor of remaining trees, and improve overall stand health by reducing competition for limited resources, including water.
7. The best, healthiest trees that have a high canopy capacity will be retained.
8. Treatments are designed to create ecological conditions that are more resilient to insect and disease outbreaks and wildfire over the long-term. Therefore, treatments will help protect remaining fisher habitat.
9. Treatments are along open Forest Service roads, where disturbance due to traffic noise is already present to some degree and where fishers are unlikely to den, forage or rest.
10. Treatments are designed to retain hardwood trees.

Although some fishers may be affected by noise disturbance, the potential to cause direct mortality, harm, or significant disruption to normal behaviors of fishers, especially during their breeding season, is very limited, due to the factors listed above.

In summary, potential effects to fishers are limited.

Alternative 3

This alternative would occur within the same boundaries and have the same treatments as the Proposed Action (Alternative 2); however, there would be no machine piling or mastication anywhere, no use of dozers for control line preparation anywhere, and no mechanical equipment use in Riparian Reserve (RR) land allocations.

The direct and indirect effects of Alternative 3 on fishers will be similar to those of the Proposed Action and the same number of acres will be affected. However, treatments will cause less intense ground disturbance and noise disturbance, and likely impact less understory vegetation and CWD due to the limitations on mechanical equipment in this alternative. Thus, impacts to fishers, their habitat and prey species/habitat will likely be less than the Proposed Action. Potential disturbance to fishers due to noise will also be reduced. However, the potential for fisher habitat loss due to high-intensity wildfire will likely be higher because fuels treatments may be less effective.

Alternative 4

This alternative would occur within the same boundaries as the Proposed Action (Alternative 2); however, no trees with DBH greater than 18 inches would be cut in the buffers, unless it is a hazard. Snags greater than (>) 18 inches would be retained in LSR and RR when not deemed a hazard to roads, landings, or operations. Snags that are determined to be hazards will be felled.

The prescriptions in the areas along roads and around plantations for this alternative are different than Alternative 2. The prescription in all buffers would thin smaller trees ("thin from below") up to the 18-inch diameter limit. The prescriptions for plantations will be the same as described in Alternative 2.

The direct and indirect effects of Alternative 4 on fishers will be similar to those of the Proposed Action and the same number of acres will be affected. However, impacts to fishers and their habitat will be less under this alternative because more large trees and snags will be retained. This would be the least impactful alternative for this species. However, the potential for fisher habitat loss due to high-intensity wildfire will likely be higher because trees may be more crowded and fuels treatments may be less effective.

Direct and Indirect Effects Determination

It is my determination that the proposed action and all alternatives may affect individual fishers, but potential effects to the population demography of this species are limited and insignificant, and will not cause a trend toward listing.

Western pond turtle (*Emys marmorata*, aka *Clemmys/Actinemys marmorata*)

Species Account

The range of the western pond turtle extends from northwestern Baja California, Mexico, north to the Puget Sound in Washington. It is generally restricted to areas west of the Sierra Nevada and Cascade Mountains (Rosenberg *et al.* 2009). Western pond turtles occur in a variety of habitat

types associated with permanent or nearly permanent water. They concentrate in ponds and low flow regions of rivers and creeks such as side channels and backwater areas, and prefer creeks that have deep, still water and sunny banks. Basking sites such as rocks and floating or partially submerged logs are important habitat components. Western pond turtles are omnivorous, but their diet typically consists primarily of insects, crayfish, carrion, and other aquatic invertebrates (Jennings and Hayes 1994, Holland 1994, Wilson *et al.* 1991).

During the spring or summer females may travel away from ponds to find sites suitable for nesting, although the travel distance to most nest sites is less than 300 meters (984 feet). Dry grassy areas are often used as nest sites. Young emerge the following spring (March-April) and travel from nest sites to watercourses (Jennings and Hayes 1994, Holland 1994). In warm climates they may be active year-round, but in colder areas they hibernate during winter in muddy bottoms or upland areas, including forests. Upland hibernation sites were up to 500 meters (1,640 ft.) from aquatic habitats (Jennings and Hayes 1994, Reese and Welsh 1998).

Characteristics of suitable habitat cited in the scientific literature cited above were combined with spatial data in Forest databases to assess potentially suitable aquatic habitats within the proposed treatment areas. The analysis area for this species extends out 1,640 feet (500 meters) from aquatic areas within treatment zones. This is appropriate because it encompasses the aquatic habitats potentially suitable for this species plus its potential nesting and upland hibernation sites.

On the Shasta-Trinity National Forest, pond turtles are known to occur in Trinity Lake, Lewiston Lake, the Trinity River, South Fork Trinity River, Hayfork Creek, Indian Valley Creek, some other tributaries as well as numerous ponds/lakes. Wildlife databases show no observations of pond turtles within treatment units, however there are several observations in the analysis area in Indian Valley Creek. The nearest recorded observation is approximately 200 feet (60 meters) from treatment units.

Direct and Indirect Effects

Proposed Action (Alternative 2)

Project activities may cause disturbance to individual western pond turtles using suitable riparian habitats in or near treatment areas. When/where the NSO SRs are applied, they will decrease potential direct effects to adult and young western pond turtles as they travel to or from nesting areas. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix A.

The potential for pond turtle habitat alteration/impacts is very limited. The project is designed to have less intense treatments within riparian reserves (RRs), which is where pond turtles and their habitat would occur. Within RRs, all true-riparian vegetation will be retained. Outside of plantations, all conifer trees over 8 inches DBH will also be retained in RRs. Riparian reserves will be treated by hand and equipment exclusion zones (EEZs) will be utilized to avoid impacts to riparian vegetation, groundwater recharge areas and steep slopes, to avoid erosion and compaction of soils, to retain trees necessary for shading, bank stabilization and as a source of future large woody debris, and to retain floodplain function. EEZs will be at least 50 feet on each side of streams. Therefore, impacts to canopy cover, waterbody shading, and the areas adjacent to waterbodies are not expected. This will also decrease the likelihood that turtles would be harmed. The only treatment type that may impact riparian vegetation is prescribed fire. However, within riparian reserves, fire will mostly be low intensity and is not expected to completely remove riparian vegetation or consume coarse wood. Extensive RPMs for RRs will further prevent potential effects to this species and its habitat (Appendix A). As a result, the potential to cause direct mortality or significant disruption to normal behavior patterns of pond turtles is very limited.

Water drafting will occur within and near the project area. Currently drafting is only proposed at four locations. One of these is a large natural pool (the “Water Hole” at the 2N07 crossing) in Indian Valley Creek and turtles have been observed nearby. Drafting is not proposed in any of the nearby lakes/ponds where turtles have been observed nor is it proposed at any “constructed ponds.” Water drafting will never remove more than 50 percent of any stream discharge. In order to maintain water quality and quantity, all water drafting is subject to extensive best management practices (BMPs) and RPMs (Appendix A); therefore impacts to turtles are expected to be minor.

In summary, potential effects to western pond turtles are limited and the extensive RPMs for riparian zones will further reduce potential effects to this species.

Alternative 3

This alternative would occur within the same boundaries and have the same treatments as the Proposed Action (Alternative 2); however, there would be no machine piling or mastication anywhere, no use of dozers for control line preparation anywhere, and no mechanical equipment use in Riparian Reserve (RR) land allocations.

The direct and indirect effects of Alternative 3 on pond turtles will be similar to those of the Proposed Action and the same number of acres will be affected. However, treatments will cause less intense ground disturbance, including in riparian areas, and likely impact less understory vegetation and CWD due to the limitations on mechanical equipment in this alternative. Thus, impacts to pond turtles and their habitat will be less than the Proposed Action. This would be the least impactful alternative for this species.

Alternative 4

This alternative would occur within the same boundaries as the Proposed Action (Alternative 2); however, no trees with DBH greater than 18 inches would be cut in the buffers, unless it is a hazard. Snags greater than (>) 18 inches would be retained in LSR and RR when not deemed a hazard to roads, landings, or operations. Snags that are determined to be hazards will be felled.

The prescriptions in the areas along roads and around plantations for this alternative are different than Alternative 2. The prescription in all buffers would thin smaller trees (“thin from below”) up to the 18-inch diameter limit. The prescriptions for plantations will be the same as described in Alternative 2.

The direct and indirect effects of Alternative 4 on pond turtles will be the same as those of the Proposed Action and the same number of acres will be affected. For all alternatives, including the Proposed Action, true-riparian plant species will be retained and outside of plantations there is already a diameter limit within RRs.

Direct and Indirect Effects Determination

It is my determination that the proposed action and all alternatives may affect individual western pond turtles, but potential effects to the population demography of this species are limited and insignificant, and will not cause a trend toward listing.

Foothill yellow-legged frog (*Rana boylii*)

Species Account

Foothill yellow-legged frogs are found in or near permanent rocky streams in a variety of habitats, including ponderosa pine, mixed conifer, and mixed chaparral. They are highly aquatic, spending most or all of their life in or near streams. They require shallow, flowing water, and

display an apparent preference for small to moderate-sized streams with at least some cobble-sized substrate (Jennings and Hayes 1994). They breed in shallow, slow flowing water with partial shading. Insects are likely the primary food source for adults. Adult foothill yellow-legged frogs are often seen breeding in pools on the main stem of the Trinity River in spring and moving to basking and foraging sites in the tributaries in the summer (Wheeler *et al.* 2014, Jennings and Hayes 1994). Mating and egg-laying occurs exclusively in streams and rivers (not in ponds or lakes) from April until early July, after streams have slowed from winter runoff (Nafis 2000-2016). They are also known to occur in the South Fork Trinity River, Hayfork Creek and other tributaries. Home ranges are typically very small, but movements of up to 165 feet (50 meters) may occur during high water conditions (CDFW 2020). Therefore, the analysis area for this species is a 165 foot (50 meter) buffer from aquatic areas within and near the treatment units. The CNDDDB database shows several observations of foothill yellow-legged frogs within a proposed treatment unit, in a tributary of Butter Creek.

Direct and Indirect Effects

Proposed Action (Alternative 2)

Project activities may cause disturbance to individual foothill yellow-legged frogs within or near treatment areas. When/where the NSO SRs are applied, they will decrease potential direct effects to foothill yellow-legged frogs during their breeding season. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix A.

The potential for habitat alteration/impacts is very limited. The project is designed to have less intense treatments within riparian reserves (RRs), which is where foothill yellow-legged frogs and their habitat would occur. Within RRs, all true-riparian vegetation will be retained. Outside of plantations, all conifer trees over 8 inches DBH will also be retained in RRs. Riparian reserves will be treated by hand and equipment exclusion zones (EEZs) will be utilized to avoid impacts to riparian vegetation, groundwater recharge areas and steep slopes, to avoid erosion and compaction of soils, to retain trees necessary for shading, bank stabilization and as a source of future large woody debris, and to retain floodplain function. EEZs will be at least 50 feet on each side of streams. Therefore, impacts to canopy cover, waterbody shading, and the areas adjacent to waterbodies where foothill yellow-legged frogs are most likely to occur are not expected. This will also decrease the likelihood that frogs would be harmed. The only treatment type that may impact riparian vegetation is prescribed fire. However, within riparian reserves, fire will mostly be low intensity and is not expected to completely remove riparian vegetation or consume coarse wood. Extensive RPMs for RRs will further prevent potential effects to this species and its habitat (Appendix A). As a result, the potential to cause direct mortality or significant disruption to normal behavior patterns of foothill yellow-legged frogs is very limited.

Water drafting will occur within and near the project area. Currently drafting is only proposed at four locations and is not proposed in any waterways where foothill yellow-legged frogs have been observed. Water drafting is not proposed at any ponds/lakes or “constructed ponds.” Water drafting will never remove more than 50 percent of any stream discharge. In order to maintain water quality and quantity, all water drafting is subject to extensive best management practices (BMPs) and RPMs (Appendix A); therefore impacts to frogs are expected to be minor.

In summary, potential effects to foothill yellow-legged frogs are limited and the extensive RPMs for riparian zones will further reduce potential effects to this species.

Alternative 3

This alternative would occur within the same boundaries and have the same treatments as the Proposed Action (Alternative 2); however, there would be no machine piling or mastication

anywhere, no use of dozers for control line preparation anywhere, and no mechanical equipment use in Riparian Reserve (RR) land allocations.

The direct and indirect effects of Alternative 3 on foothill yellow-legged frogs will be similar to those of the Proposed Action and the same number of acres will be affected. However, treatments will cause less intense ground disturbance, including in riparian areas, and likely impact less understory vegetation and CWD due to the limitations on mechanical equipment in this alternative. Thus, impacts to foothill yellow-legged frogs and their habitat will be less than the Proposed Action. This would be the least impactful alternative for this species.

Alternative 4

This alternative would occur within the same boundaries as the Proposed Action (Alternative 2); however, no trees with DBH greater than 18 inches would be cut in the buffers, unless it is a hazard. Snags greater than (>) 18 inches would be retained in LSR and RR when not deemed a hazard to roads, landings, or operations. Snags that are determined to be hazards will be felled.

The prescriptions in the areas along roads and around plantations for this alternative are different than Alternative 2. The prescription in all buffers would thin smaller trees (“thin from below”) up to the 18-inch diameter limit. The prescriptions for plantations will be the same as described in Alternative 2.

The direct and indirect effects of Alternative 4 on foothill yellow-legged frogs will be the same as those of the Proposed Action and the same number of acres will be affected. For all alternatives, including the Proposed Action, true-riparian plant species will be retained and outside of plantations there is already a diameter limit within RRs.

Direct and Indirect Effects Determination

It is my determination that the proposed action and all alternatives may affect individual foothill yellow-legged frogs, but potential effects to the population demography of this species are very limited and insignificant, and will not cause a trend toward listing.

Southern torrent salamander (*Rhyacotriton variegatus*)

Species Account

Southern torrent salamanders occur in aquatic habitats in conifer forests of the Coast Range from Mendocino County, California to northwestern Oregon. They occur in springs, seeps, small streams, and margins of larger streams, where they avoid open water and seek the cover of moss, rocks, and organic debris in shallow, cold water (Welsh and Lind 1996, Jennings and Hayes 1994). They occur within a relatively narrow range of physical and microclimatic conditions. They are associated with cold, clear headwater to low-order streams with loose rocky substrates (low sedimentation) in humid forest habitats with large conifers, abundant moss, and generally greater than 80% canopy closure. Adults eat amphipods, springtails, and insect larvae (Jennings and Hayes 1994). The southern torrent salamander depends upon streamside conditions (microclimate and habitat structure) that in northwestern California are typically best created, stabilized, and maintained within late-successional forests. They only occur in permanent water; on land they only occur within the splash zone or on moss-covered rocks with trickling water (Welsh and Lind 1996, Jennings and Hayes 1994). Therefore, the analysis area for this species is a 50 foot (15 meter) buffer from aquatic areas within and near the treatment units. This buffer is likely much larger than actually utilized by this species.

Southern torrent salamanders are typically associated with wet coastal areas, and the project area is approximately 40 miles from the Pacific Coast. There are no observations in the NRIS database on the entire STNF. The nearest observation in CNDDB is approximately five miles to

the southwest, in a tributary on the west side of the South Fork Trinity River. The project area is likely outside the known range of this species.

Direct and Indirect Effects

Proposed Action (Alternative 2)

If southern torrent salamanders do exist within/near the project area, project activities may cause disturbance to individual salamanders within or near treatment areas. When/where the NSO SRs are applied, they will decrease potential direct effects to salamanders. If NSO surveys are conducted, NSO SRs may be lifted where there is no nesting activity, as described in Appendix A.

The potential for habitat alteration/impacts is extremely limited and unlikely. Waterways where salamanders would exist are within riparian reserves (RRs) which are subject to extensive riparian RPMs including EEZs. EEZs will be at least 50 feet on each side of streams, which would encompass the entire southern torrent salamander analysis area and potential habitat/use area, as defined above. These RPMs will greatly reduce potential effects to this species and aquatic habitat (Appendix A). The project is designed to maintain high value NSO habitat, thus also maintaining the highest quality southern torrent habitat (late successional forests). As a result, the potential to cause direct mortality or significant disruption to normal behavior patterns of southern torrent salamanders is very unlikely.

Water drafting will occur within and near the project area. Currently drafting is only proposed at four locations and is not proposed in any waterways known or expected to contain southern torrent salamanders. Water drafting will never remove more than 50 percent of any stream discharge. In order to maintain water quality and quantity, all water drafting is subject to extensive best management practices (BMPs) and RPMs (Appendix A); therefore impacts to southern torrent salamanders are not expected.

In summary, potential effects to southern torrent salamanders are limited and the extensive RPMs for riparian zones will further reduce potential effects to this species.

Alternative 3

This alternative would occur within the same boundaries and have the same treatments as the Proposed Action (Alternative 2); however, there would be no machine piling or mastication anywhere, no use of dozers for control line preparation anywhere, and no mechanical equipment use in Riparian Reserve (RR) land allocations.

The direct and indirect effects of Alternative 3 on southern torrent salamanders will be the same as the Proposed Action and the same number of acres will be affected. Treatments will cause less intense ground disturbance, including in riparian areas, and likely impact less understory vegetation and CWD due to the limitations on mechanical equipment in this alternative. However, for all alternatives, including the Proposed Action, true-riparian plant species will be retained and EEZs already exist that encompass and protect southern torrent salamanders and their habitat. Thus, impacts to southern torrent salamanders and their habitat will be about the same as the Proposed Action.

Alternative 4

This alternative would occur within the same boundaries as the Proposed Action (Alternative 2); however, no trees with DBH greater than 18 inches would be cut in the buffers, unless it is a hazard. Snags greater than (>) 18 inches would be retained in LSR and RR when not deemed a hazard to roads, landings, or operations. Snags that are determined to be hazards will be felled.

The prescriptions in the areas along roads and around plantations for this alternative are different than Alternative 2. The prescription in all buffers would thin smaller trees (“thin from below”) up to the 18-inch diameter limit. The prescriptions for plantations will be the same as described in Alternative 2.

The direct and indirect effects of Alternative 4 on southern torrent salamanders will be the same as those of the Proposed Action and the same number of acres will be affected. For all alternatives, including the Proposed Action, true-riparian plant species will be retained, outside of plantations there is already a diameter limit within RRs, and EEZs exist that encompass and protect southern torrent salamanders and their habitat.

Direct and Indirect Effects Determination

It is my determination that the proposed action and all alternatives may affect individual southern torrent salamanders, but potential effects to the population demography of this species are very limited and insignificant, and will not cause a trend toward listing.

Western bumble bee (*Bombus occidentalis*)

Species Account

Western bumble bees are generalist foragers on pollen and nectar from a diverse array of plant species. They are commonly found in riparian habitats, meadows, and recently disturbed areas. Nests are often in abandoned rodent burrows, and less frequently in abandoned bird nests or open grassy areas (Evans *et al.* 2008, Koch *et al.* 2012, Xerces Society 2013). In studies in the Sierra Nevada, abundance of these bees was influenced positively by the presence and proportion of meadows in surrounding habitat, in addition to meadow wetness (Hatfield and LeBuhn 2007).

This species inhabits the western United States from the Great Plains to the Pacific Coast and from Alaska to Southern California. Populations in west coast states have declined dramatically since the 1990's. The most likely cause of this decline is the spread of pests and diseases from the commercial bee industry (Evans *et al.* 2008). Other threats include habitat alteration and removal in the form of agricultural intensification, livestock grazing, urban development, and landscape fragmentation, which may reduce pollen and nectar sources and affect potential nest sites. Use of broad-spectrum herbicides may also reduce pollen and nectar sources. Additional reported threats include invasive species, use of insecticides, and climate change. Fire suppression may result in conversion of open meadows to forested habitats, reducing availability of meadow nest sites for this species (Evans *et al.* 2008, Koch *et al.* 2012, Xerces Society 2013).

Accounts of foraging ranges for bumblebees in the scientific literature vary widely (Greenleaf *et al.* 2007). The analysis area for this report consists of all lands within 1.3 miles of proposed treatments. This bounding is appropriate because it is likely to encompass the typical foraging range for this species, based on data in the literature cited above. According to wildlife databases, the nearest observation is approximately five miles to the southwest; however it is from 1968. There are some open areas in the forest lands in and near project units, and some of these areas may support habitats suitable for this species.

Direct and Indirect Effects

Proposed Action (Alternative 2)

If western bumble bees do use the project area, project activities may cause disturbance to individual bees near treatment areas, and individual bees may move away from treatment areas temporarily during project implementation due to the presence of humans and equipment.

The potential for habitat alteration/impacts is very limited. The project is designed to have less intense treatments within areas that western bumble bee habitat may occur such as meadows and riparian reserves (RRs). Meadows would be lacking trees and would not be targeted for treatment. Within RRs, all true-riparian vegetation will be retained. Outside of plantations, all conifer trees over 8 inches DBH will also be retained in RRs. Within RRs, equipment exclusion zones (EEZs) will be utilized to avoid impacts to riparian vegetation, soils, and to retain trees necessary for shading, bank stabilization and as a source of future large woody debris. EEZs will be at least 50 feet on each side of streams. This will also decrease the likelihood that bees would be harmed. The only treatment type that may impact riparian vegetation is prescribed fire. However, within riparian reserves, fire will mostly be low intensity and is not expected to completely remove riparian vegetation. Extensive RPMs for RRs will further prevent potential effects to this species and its habitat (Appendix A). As a result, the potential to cause direct mortality or significant disruption to normal behavior patterns of western bumble bees is very limited. Use of insecticides is not proposed, so there will not be any effects to this species from insecticide use.

The proposed treatments will not result in a significant or long-term reduction in food availability to this species for the following reasons:

1. This species is a generalist forager, utilizing a wide variety of flowering species as food sources.
2. Treatments are likely to have a very limited effect on flowering plants.
3. This project does not include use of herbicides, so there will be no effects to flowering plants from herbicide use.

In summary, potential effects to western bumblebees are limited and the extensive RPMs for riparian zones will further reduce potential effects to this species.

Alternative 3

This alternative would occur within the same boundaries and have the same treatments as the Proposed Action (Alternative 2); however, there would be no machine piling or mastication anywhere, no use of dozers for control line preparation anywhere, and no mechanical equipment use in Riparian Reserve (RR) land allocations.

The direct and indirect effects of Alternative 3 on western bumble bees will be similar to those of the Proposed Action and the same number of acres will be affected. However, treatments will cause less intense ground disturbance, including in riparian areas, and likely impact less understory vegetation and CWD due to the limitations on mechanical equipment in this alternative. Thus, impacts to western bumble bees and their habitat will be less than the Proposed Action. This would be the least impactful alternative for this species.

Alternative 4

This alternative would occur within the same boundaries as the Proposed Action (Alternative 2); however, no trees with DBH greater than 18 inches would be cut in the buffers, unless it is a hazard. Snags greater than (>) 18 inches would be retained in LSR and RR when not deemed a hazard to roads, landings, or operations. Snags that are determined to be hazards will be felled.

The prescriptions in the areas along roads and around plantations for this alternative are different than Alternative 2. The prescription in all buffers would thin smaller trees ("thin from below") up to the 18-inch diameter limit. The prescriptions for plantations will be the same as described in Alternative 2.

The direct and indirect effects of Alternative 4 on western bumble bees will be the same as those of the Proposed Action and the same number of acres will be affected. For all alternatives, including the Proposed Action, true-riparian plant species will be retained and outside of plantations there is already a diameter limit within RRs.

Direct and Indirect Effects Determination

It is my determination that the proposed action and all alternatives may affect individual western bumble bees, but potential effects to the population demography of this species are very limited and insignificant, and will not cause a trend toward listing.

Big Bar [Pressley] hesperian snail (*Vespericola pressleyi*)

Species Account

Big Bar hesperian snails inhabit conifer and/or hardwood forest habitat in permanently damp areas within 200 meters (656 feet) of seeps, springs and stable streams. Herbaceous vegetation and leaf litter are common habitat elements associated with this species. Woody debris and rock refugia near water are used by this species during dry and cold periods. Recommended protection measures include conserving favorable canopy cover, woody debris and herbaceous vegetation in suitable habitats (USDI Bureau of Land Management 1999, Duncan *et al.* 1999, Roth 1984). This species is known primarily from the Big Bar area of the Trinity River Management Unit, but has also been found in limited locations on the South Fork Management Unit.

The analysis area for this species is a 656 feet (200 m) buffer from aquatic areas within and near the treatment units, based upon literature above. According to wildlife databases, there are two Big bar hesperian observations within the analysis area and they are within proposed treatment units (road/plantation buffer).

Direct and Indirect Effects

Proposed Action (Alternative 2)

Project activities may cause disturbance to individual Big Bar hesperian snails within treatment areas. The potential for habitat alteration/impacts is very limited. Big Bar hesperian snails are closely associated with moist or wet habitats, and the RPMs incorporated into the design of this project to protect riparian reserves will greatly reduce potential effects to this species and its habitat. The observations mentioned above are located within riparian reserves and the project is designed to have less intense treatments within riparian reserves (RRs). Within RRs, all true-riparian vegetation will be retained. Outside of plantations, all conifer trees over 8 inches DBH will also be retained in RRs. Within RRs, equipment exclusion zones (EEZs) will be utilized to avoid impacts to riparian vegetation, soils, and to retain trees necessary for shading, bank stabilization and as a source of future large woody debris. EEZs will be at least 50 feet on each side of streams and will also exist around wetlands (Appendix A). The only treatment type that may impact riparian vegetation is prescribed fire. However, within riparian reserves, fire will mostly be low intensity and is not expected to completely remove riparian vegetation or consume coarse wood. In addition, there are RPMs to retain coarse woody debris (CWD) which is an important habitat element for this species (Appendix A). As a result, the potential to cause direct mortality or significant disruption to normal behavior patterns of Big Bar hesperian snails is very limited.

In summary, potential effects to Big Bar hesperian snails are limited and the extensive RPMs for riparian zones and CWD will further reduce potential effects to this species and its habitat (Appendix A).

Alternative 3

This alternative would occur within the same boundaries and have the same treatments as the Proposed Action (Alternative 2); however, there would be no machine piling or mastication anywhere, no use of dozers for control line preparation anywhere, and no mechanical equipment use in Riparian Reserve (RR) land allocations.

The direct and indirect effects of Alternative 3 on Big Bar hesperian snails will be similar to those of the Proposed Action and the same number of acres will be affected. However, treatments will cause less intense ground disturbance, including in riparian areas, and likely impact less understory vegetation and CWD due to the limitations on mechanical equipment in this alternative. Thus, impacts to Big Bar hesperian snails and their habitat will be less than the Proposed Action. This would be the least impactful alternative for this species.

Alternative 4

This alternative would occur within the same boundaries as the Proposed Action (Alternative 2); however, no trees with DBH greater than 18 inches would be cut in the buffers, unless it is a hazard. Snags greater than (>) 18 inches would be retained in LSR and RR when not deemed a hazard to roads, landings, or operations. Snags that are determined to be hazards will be felled.

The prescriptions in the areas along roads and around plantations for this alternative are different than Alternative 2. The prescription in all buffers would thin smaller trees ("thin from below") up to the 18-inch diameter limit. The prescriptions for plantations will be the same as described in Alternative 2.

The direct and indirect effects of Alternative 4 on Big Bar hesperian snails will be the same as those of the Proposed Action and the same number of acres will be affected. For all alternatives, including the Proposed Action, true-riparian plant species will be retained and outside of plantations there is already a diameter limit within RRs.

Direct and Indirect Effects Determination

It is my determination that the proposed action and all alternatives may affect individual Big Bar hesperian snails, but potential effects to the population demography of this species are very limited and insignificant, and will not cause a trend toward listing.

Species Not Analyzed in Detail

Species Accounts:

Yellow rails (*Coturnicops noveboracensis*) are secretive birds inhabiting marshes, especially large marshes. They breed primarily in eastern Canada and north-central United States and winter primarily in the southeastern United States (Leston and Bookhout 2015). Their known range includes portions of southwest Oregon and northeastern and coastal California. The project area is well outside the known range of this species (Southwell 2002, Shuford and Garaldi 2008).

Wolverines (*Gulo gulo luscus*) primarily occupy coniferous forests, although they will also use alpine habitats (Banci 1994). Wolverines seem to prefer areas without human disturbance, especially when denning from late winter through early spring (USDI Fish and Wildlife Service 2003). There have been no confirmed wolverine sightings on the Forest over the past 20 years. Surveys conducted in California over that time span using remote cameras and track plate surveys, including survey sites on the Shasta-Trinity National Forest, have resulted in only one confirmed observation site in the state, on the Tahoe National Forest, and there are no known breeding populations of wolverines anywhere in California (USDI Fish and Wildlife Service

2016c). The project is outside the known range of this species and wolverines are not expected to occur.

Northern red-legged frogs (*Rana aurora aurora*) inhabit perennial and, less often, intermittent watercourses in northern California north to British Columbia. These watercourses are typically bordered by dense growth of herbaceous or shrub species (Jennings and Hayes 1994, USDI Fish and Wildlife Service 2002). This species is largely restricted to wet coastal climates (Jennings and Hayes 1994). Wildlife databases have no records of this species on the entire Shasta-Trinity National Forest. The project is outside the known and expected range of this species.

Cascades frogs (*Rana cascadae*) inhabit high-elevation ponds, lakes, and streams within open coniferous forests from Washington to northern California (Pope et al. 2014, Briggs 1987, Jennings and Hayes 1994). Wildlife databases show no observations of Cascades frogs in or near the project area. The nearest recorded observation is approximately 40 miles to the northeast in the Trinity Alps Wilderness. This project is outside the known and expected range of this species.

Shasta salamanders (*Hydromantes shastae*) inhabit moist rocky areas such as limestone outcrops. Their known distribution is limited to Shasta County, primarily near Shasta Lake (CDFW, 2020). The project area is outside the known range of this species.

California floaters (*Anodonta californiensis*) are aquatic mollusks associated with lakes and slow rivers. Their distribution on the Forest is restricted to the Fall and Pit River systems in Shasta County (Furnish 2007). The project area is outside the known range of this species.

Black juga snails (*Juga nigrina*) are aquatic mollusks inhabiting perennial streams. Their distribution is restricted to tributaries of the Sacramento River system (California Department of Fish and Game 1981). The project area is outside the known range of this species.

Scalloped juga snails (*Juga [Calibasis] occata*) are aquatic mollusks associated with large river systems. Their known distribution on the Forest is restricted to the lower Pit River (Furnish 2007, California Department of Fish and Game 1981). The project area is outside the known range of this species.

Kneecap lanx limpets (*Lanx patelloides*) are aquatic mollusks associated with large river systems. Their known distribution on the Forest is restricted to the Sacramento River and its large tributaries (California Department of Fish and Game 1981). The project area is outside the known range of this species.

Montane peaclams (*Pisidium ultramontanum*) are aquatic mollusks associated with sand-gravel substrates. There are historical records of this species from the Pit River system, but there are no known extant populations on the Forest (Furnish 2007, Duncan 2008). The project area is outside the known range of this species.

Nugget pebblesnails (*Fluminicola seminalis*) are aquatic mollusks typically associated with large streams that have gravel-cobble substrate and clear, flowing water. Their distribution is limited to the area around Lake Shasta, California (Furnish 2007, USDA Forest Service and USDI Bureau of Land Management 1999). The project area is outside the known range of this species.

Shasta sideband snails (*Monadenia troglodytes troglodytes*) and **Wintu sideband snails (*Monadenia troglodytes wintu*)** are associated with limestone areas including caves and talus slopes. Their distribution on the Forest is limited to the near Shasta Lake, California (USDI Bureau of Land Management 1999). The project area is outside the known range of these species.

Shasta chaparral snails (*Trilobopsis roperi*) are associated primarily with rockslides. Their distribution on the Forest is limited to the area near Shasta Lake, California (USDI Bureau of Land Management 1999). The project area is outside the known range of this species.

Tehama chaparral snails (*Trilobopsis tehamana*) are associated with rocky talus areas (USDI Bureau of Land Management 1999). There are no observations on this Forest. The project area is outside the known range of this species.

Shasta hesperian snails (*Vespericola shasta*) inhabit moist bottomlands and caves around Shasta Lake (USDI Bureau of Land Management 1999) as well as other limited areas in Shasta County. The project area is outside the known range of this species.

Direct, Indirect & Cumulative Effects Determination

The project area lies outside the known range of all of these species. There will be no direct, indirect or cumulative effects to any of these species.

CUMULATIVE EFFECTS

Analysis of cumulative effects under the National Environmental Policy Act (NEPA) addresses the impact on the environment that results from the incremental impact of the proposed action when added to other past, present and reasonably foreseeable future actions, regardless of which agency (federal or non-federal) or person undertakes these actions (40 CFR 1508.7).

This cumulative effects analysis is bounded in space and time to properly evaluate whether there will be an overlap of effects caused by this project in combination with effects of other past, present, or future foreseeable actions. This analysis is bounded in space to include any area within 1.3 miles of treatment areas. This area is appropriate because it considers home range sizes of the Forest Service Sensitive Species considered in this analysis, and includes all areas of treatment plus a surrounding area adequate to assess potential effects to individuals of these species. This analysis is bounded in time to include all actions up to 30 years into the future. This reflects typical distribution patterns of Forest Service Sensitive species, the predicted life spans of individuals of Forest Service Sensitive species, and the potential for effects to individuals that may inhabit the project area at this time.

The effects of past actions are reflected in the descriptions of currently existing conditions. Lands in the vicinity of the project area include Forest Service, a very small amount of privately owned forest lands, as well as scattered rural residences (seasonal or permanent) and privately owned agricultural lands. Reasonably foreseeable future actions on these lands include continued rural residential use, agricultural use and timber harvest. Other ongoing activities on private and federal lands in the analysis area include annual road maintenance, recreation use, fire suppression, and grazing. Present and reasonably foreseeable future actions include:

- Private timber harvest- Timber harvest plans (THP's) and THP exemptions filed by private landowners. These activities include THP's for clearcuts and forest thinnings; exemptions for treating dead, dying and diseased trees; exemptions for forest conversions of three acres or less; and exemptions for emergency post-fire timber harvest. Currently there are none planned.
- Grazing allotments on Forest Service lands
- 2015 Fires Reforestation- replanting areas that burned in the 2015 wildfires
- Middle Hayfork – plantation thinning and fuels treatments
- Westside Plantations- plantation thinning and fuels treatments
- Trinity Post Fire Hazard Reduction & Safety (TPFHRS) Project - hazard tree abatement and fuels treatments along roadsides that burned

Potential effects of the Roads and Plantation Pilot project to Forest Service Sensitive species consist of disturbance/injury and habitat modification. Some species analyzed in this report are subject to potential disturbance and/or injury from project activities, and some are subject to potential habitat modification. This analysis will therefore focus on these two potential sources of cumulative effects.

Disturbance/injury: Potential disturbance/injury to Forest Service Sensitive species in or near the project area is described in the analyses for each individual species. Of the action alternatives, potential direct effects are greatest with Alternative 2, the Proposed Action. Potential direct effects of Alternative 3 are less than Alternative 2 due to a restriction on mechanical equipment use. Treatments will be less intense under Alternative 3 because there will be less ground disturbance and noise disturbance. Potential direct effects of Alternative 4 are less than Alternative 2 due to a diameter limit of 18 inches. More large trees will be retained under this alternative. Potential direct effects of all action alternatives will be relatively limited in intensity, and will be limited to the time required for project implementation. In addition, SRs are incorporated into the project to reduce noise disturbance and direct harm/injury during the breeding season.

Other activities in the analysis area consist primarily of forest management and scattered rural residential and agricultural use. Activities on residential parcels could result in disturbance/injury to Forest Service Sensitive species, and forest management on private or Forest Service lands may also cause disturbance/injury. These potential effects are likely to be limited due to the scattered nature and limited amount of these rural residences. The very intermittent nature of forest management activities in any given location also limits the potential impacts to sensitive species. Populations of Forest Service Sensitive species inhabiting the project area are also likely to be relatively inured to these ongoing sources of potential disturbance/injury. As a result, when the potential direct effects of the proposed project are added to the potential effects of current and foreseeable future actions, the potential effects of this project are not expected to result in cumulative adverse effects to any Forest Service Region 5 Sensitive species potentially using the suitable habitats in the analysis area, will have no significant effect on population demography of any of these species, and will not lead to a trend toward federal listing of any of these species.

Habitat modification: Some of the potential habitat modifications from this project may persist well into the future. Of the action alternatives, potential indirect effects are greatest with Alternative 2, the Proposed Action. Potential indirect effects of Alternative 3 are less than Alternative 2 due to a restriction on mechanical equipment use. Treatments will be less intense under Alternative 3 because there will be less ground disturbance and likely less impacts to understory vegetation and CWD due to the limitations on mechanical equipment in this alternative. Potential indirect effects of Alternative 4 are less than Alternative 2 due to a diameter limit of 18 inches. More large trees and snags, an important habitat element for many species, will be retained under this alternative. In the long term, all action alternatives will accelerate the development of the late-successional habitats that are the favored habitats of many Forest Service Sensitive species, thus increasing habitat suitability for those species. Project implementation will also reduce the likelihood of future high intensity fires and insect/disease outbreaks that would result in loss of habitats.

Some suitable habitats on the parcels in the analysis area have already been altered through residential or agricultural use and forest management. Potential future effects are likely to be limited due to the scattered nature and limited amount of the rural residences. Private timber land makes up a very minor portion of the analysis area (approximately 100 acres) and the majority of that has already been cleared, leaving no suitable habitat. The plantations that will be treated in the Middle Hayfork and Westside Plantations projects are generally lacking suitable habitat. The areas that will be treated in the TPFHRS and 2015 Fire Reforestation Projects are also lacking suitable habitat since they burned. Forest management activities in any given location are expected to be very intermittent in nature, and management patterns are not expected to change current overall conditions in any significant way in regard to habitat suitability for Forest Service Sensitive species. Low-intensity grazing on Forest

Service allotments primarily affects forbs and grasses, and may have localized effects to riparian habitats. The Indian Valley Creek/Meadow Restoration project is expected to have primarily beneficial effects to the habitat of riparian dependent species. When the potential habitat modifications resulting from this project are added to the potential effects of current and foreseeable future actions, the potential effects of this project are not expected to result in cumulative adverse effects to any Forest Service Region 5 Sensitive species potentially using the suitable habitats in the analysis area, will have no significant effect on population demography of any of these species, and will not lead to a trend toward federal listing of any of these species.

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APPENDIX A. RESOURCE PROTECTION MEASURES⁵

Seasonal restrictions (SRs)⁶ will be implemented to minimize potential impacts during sensitive life history stages to northern spotted owls, fishers, bald eagles, northern goshawks, and peregrine falcons as identified below:

Northern spotted owl (analyzed in project wildlife Biological Assessment)

1. For northern spotted owls (*Strix occidentalis caurina*), seasonal restrictions (SRs)⁸ are established in collaboration with the US Fish and Wildlife Service to minimize potential disturbance or harm to this species.
 - A February 1 through September 15 SR will be imposed on activities that modify suitable habitat within 0.5-miles of an active nest or within unsurveyed suitable (NRF) habitat.
 - A February 1 through July 9 SR will be imposed on activities that create above-ambient loud and continuous noise for ≥ 2 hours within 0.25-miles of an active nest or unsurveyed suitable (NRF) habitat.
 - For smoke producing activities within 0.25 miles of active nests and unsurveyed suitable habitat, employ firing techniques that provide good smoke dispersion and ventilation aloft and/or away from active nests and unsurveyed suitable habitat.
 - If effects of smoke cannot be avoided or minimized to a discountable level, a February 1st through July 9th SR will apply, and prescribed burning will be conducted outside the seasonal restriction period for the NSO.
 - If surveys to protocol (or surveys using methods agreed upon with the USFWS) show no nesting activity within distances specified for NSO SRs, SRs may be lifted.

Bald eagles, Northern goshawks & Peregrine falcons

2. For bald eagles, peregrine falcons, and northern goshawks, the following measures will apply to activities that result in disturbance from smoke and/or loud and continuous noise:
 - For smoke producing activities within 0.25 miles of active nests, employ firing techniques that provide good smoke dispersion and ventilation aloft and/or away from active nests.
 - If effects of smoke cannot be avoided or minimized within 0.25 miles of an active nest site, prescribed burning will be conducted outside the seasonal restriction period for the applicable species.
 - Loud and Continuous Noise: a SR will apply within 0.25 miles of all known nest sites to all activities causing loud and continuous noise that will potentially disturb these species during the breeding season. If a management plan has been written for a specific nesting site, the provisions of the plan will be incorporated into the project

⁵ See Project EA for full list of Resource Protection Measures and Best Management Practices.

⁶ Seasonal restrictions, also known as limited operating periods (LOPs), refer to the period of time when operations are limited or restricted. It occurs during times when species are more sensitive to disturbance.

design. If surveys show no nesting activity within 0.25 miles of proposed activities at the time of implementation, SRs may be lifted.

3. The applicable SRs for these activities are as follows:
 - Bald eagles: January 1 through July 31;
 - Peregrine falcons and northern goshawks: February 1 through August 15

Sensitive bats

4. No caves or mines are known to exist within or near proposed activities. If during project layout or implementation caves are found in units or within 250 feet of unit boundaries, a soil scientist, forest cave coordinator, or on-Forest designee, in coordination with a wildlife biologist, would be consulted and a buffer flagged on the ground identifying an equipment exclusion zone, and/or modification of the prescription in the vicinity if needed. The following RPMs will also apply if new caves or mines are discovered:
 - a) No noise-generating activities or timber harvest will take place within 250 feet from caves or mines to protect known or potential sensitive bat species (Townsend's big-eared bat, pallid bat, and fringed myotis) roost sites. Activities necessary to address safety threats (e.g. hazard trees) will prevail over this measure.
 - b) Options for conducting burning around caves/mines could include the following:
 - Limit burning to outside the breeding season (do not burn March 1 through August 31); or
 - Burn under prevailing wind conditions that disperse smoke away from cave/mine entrances.

Fisher

5. To reduce disturbance to fisher den sites, prescribed burning and vegetation management activities will be conducted outside of the denning season (March 15 through July 31) when within 300 feet of a known fisher den site.

Coarse Woody Debris

6. Where it is available and will not cause a safety concern for implementation, an average of at least 15 tons per acre of large wood in the form of logs (greater than 20 inches diameter and 10 feet long) and snags (15 inches or greater in diameter) will be retained, to the greatest extent possible, for wildlife benefit. Logs and snags in advanced states of decay (decay classes 3-5) and those with deformities such as cat faces, broken or forked tops, hollows or cavities will be prioritized for retention.

Riparian Reserves⁷

7. Riparian Reserves in the project area are specified as follows:

⁷ See Project EA or file for full list of RPMs and BMPs

- a) Fish-bearing streams. The stream and the area from the edge of the active stream channel to the top of the inner gorge, or a distance equal to the height of 2 site potential trees on each side of the channel, or a distance of 300 feet on each side of the channel, whichever is greatest.
 - b) Perennial nonfish-bearing streams. The stream and the area from the edge of the active stream channel to the top of the inner gorge, or a distance equal to the height of 1 site potential tree on each side of the channel, or a distance of 150 feet on either side of the channel, whichever is greatest.
 - c) Intermittent nonfish-bearing streams. The stream channel and the area from the edge of the channel to the top of the inner gorge, or a distance equal to the height of 1 site potential tree, or a distance of 100 feet on each side of the channel, whichever is greatest.
 - d) Wetlands greater than one acre. The body of water and the extent of the seasonally saturated soil.
 - e) Wetlands less than one acre. The wetland and the area from the edges of the wetland to the outer edges of the riparian vegetation.
 - f) Active landslide areas. The extent of the unstable or potentially unstable area.
8. An equipment exclusion zone (EEZ) will be utilized within the Riparian Reserves to:
- a) Avoid unacceptable impacts to riparian vegetation, groundwater recharge areas, steep slopes, highly erodible soils, or unstable areas.
 - b) Maintain or provide sufficient ground cover to encourage infiltration, avoid erosion, and to filter pollutants.
 - c) Avoid detrimental soil compaction.
 - d) Retain trees necessary for shading, bank stabilization, and as a future source of large woody debris.
 - e) Retain floodplain function.
9. EEZs in the project area are specified as follows:
- a) Perennial streams. The stream and the area from the edge of the active stream channel to the top of the inner gorge, or a distance of 150 feet on each side of the channel, whichever is greatest.
 - b) Intermittent streams. The stream channel and the area from the edge of the channel to the top of the inner gorge, or a distance of 50 feet on each side of the channel, whichever is greatest. Areas within Riparian Reserves with slopes greater than 35%, highly erodible soils, or high soil compaction risk are also included in the EEZ.
 - c) Wetlands greater than one acre. The body of water and the extent of the seasonally saturated soil.
 - d) Wetlands less than one acre. The wetland and the area from the edges of the wetland to the outer edges of the riparian vegetation.
 - e) Active landslide areas. The entire extent of the unstable or potentially unstable area.
10. Inner gorges and active landslide areas are lands unsuitable for timber production.

11. Mark the boundaries of Riparian Reserves, EEZs, and lands unsuitable for timber production on the ground before land disturbing activities.
 - a) Any changes to the boundaries of inner gorges and active landslide areas has to be approved by the geologist before ground-disturbing activities.
12. Alter prescribed fire prescriptions and control actions in the Riparian Reserves as needed to maintain ecosystem structure, function, and processes and onsite and downstream water quality.
 - a) Any trees greater than five inches in diameter felled within the EEZ of perennial streams will be left in place. Activity fuels that remain after meeting wildlife, riparian, soil, and other environmental needs will be considered surplus and a potential fire hazard. The amount and method of disposal will be determined in consultation with a fish biologist and/or hydrologist.
 - i. An exception is allowed where a road runs parallel to a perennial stream within the EEZ. Trees uphill of the road may be removed. However, equipment used to remove trees will remain on the existing roadbed.
 - b) Pretreat Riparian Reserves and drainage ways to reduce excessive fuel loadings.
 - c) Avoid building firelines in or around riparian areas, wetlands, marshes, bogs, fens, or other sensitive water-dependent sites unless needed to protect life, property, or wetlands.
 - d) Construct any essential fireline in the Riparian Reserve in a manner that minimizes the amount of area and soil disturbed.
 - e) Keep high-intensity fire out of Riparian Reserves unless suitable measures are used to avoid or minimize adverse effects to water quality.
 - f) Avoid or minimize complete removal of the organic layer when burning in riparian areas or wetlands to maintain soil productivity, infiltration capacity, and nutrient retention.
 - g) Rehabilitate fireline in the Riparian Reserve after prescribed fire treatment is completed.
 - h) Remove debris added to stream channels as a result of the prescribed burning unless debris is prescribed to improve fisheries habitat.
 - i) Stream shading will not be reduced at any time by more than 10 percent below pre-project levels.
 - j) Treatments in active landslide areas will be phased to reach the desired condition.
13. Conduct prescribed fire treatments, including pile burning, for slash disposal in a manner that encourages efficient burning to minimize soil impacts while achieving treatment objectives.
 - a) Avoid piling and burning for slash removal in Riparian Reserves to the extent practicable.
 - i. Hand piling and pile burning will not occur within 50 feet of the stream.
 - ii. Hand piling and pile burning is allowed in active landslide areas.

Water Drafting

14. Control actions designed to protect water quantity include the following:

- Water drafting will occur at existing sites identified on the final project map.
- Water drafting from fish-bearing streams is allowed only where immediate downstream discharge is maintained at 1.5 cubic feet per second or greater.
- Water drafting shall never remove more than 50 percent of any stream discharge.

15. Control actions designed to protect fish include the following:

- Utilize a fish screen to prevent fish entrapment.
- Water drafting sites not within habitat accessible by anadromous salmonids will be given priority for use. When needed, water drafting may occur in habitat accessible by anadromous salmonids. In all cases where water drafting occurs within anadromous salmonid habitat, 2001 National Marine Fisheries Service's (NMFS) Water Drafting Specifications⁸ will be adhered to. Any new drafting sites will be approved by a Forest Service fish biologist and/or hydrologist prior to use and the following rules will apply:
 - Allow drafting from ephemeral streams, intermittent streams, wetlands or constructed ponds provided that sufficient water quantity and quality remains to support associated wildlife species and riparian values.
 - Never allow drafting to remove more than 75 percent of constructed pond water.

⁸ The 2001 National Marine Fisheries Service's (NMFS) Water Drafting Specification document is located at http://www.westcoast.fisheries.noaa.gov/publications/hydropower/water_drafting_specification_guidelines.pdf.